375

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SAMS PHOTOFACT* SET No. 375

*TRADEMARK

TRADE NAME	MODEL	SET AND FOLDER No.
PRODUCTION CHANGE BULLETIN		
Motorola	Chassis TS-538, Y, VTS-538, Y, WTS-538, Y Tel. Rec.	375-1
TELEVISION RECEIVERS		
Firestone	13-G-220, 13-G-221, 13-G-222, 13-G-223 (Code 334-6-A62/A, 334-6-N62/A)	375-2
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Packard Bell 17VT4 - Ch. V8-2

RCA 21RT8202-8425
21T-8202- etc
8400 etc

Chassis:
KCS113H-K-A-B
KCS113P-R-E-F

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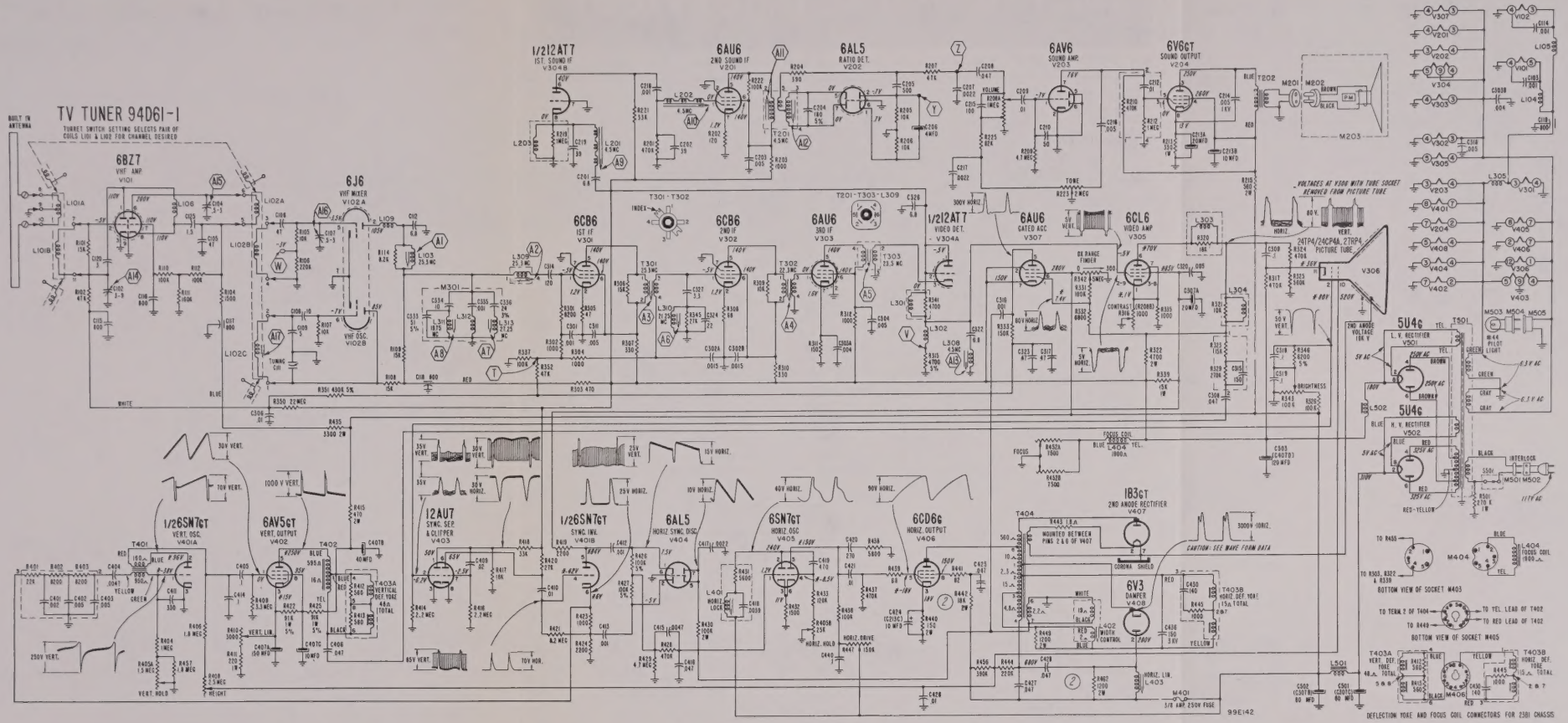


ADMIRAL CHASSIS 23E1Z (Models C2516Z, C2517Z, H2516Z)

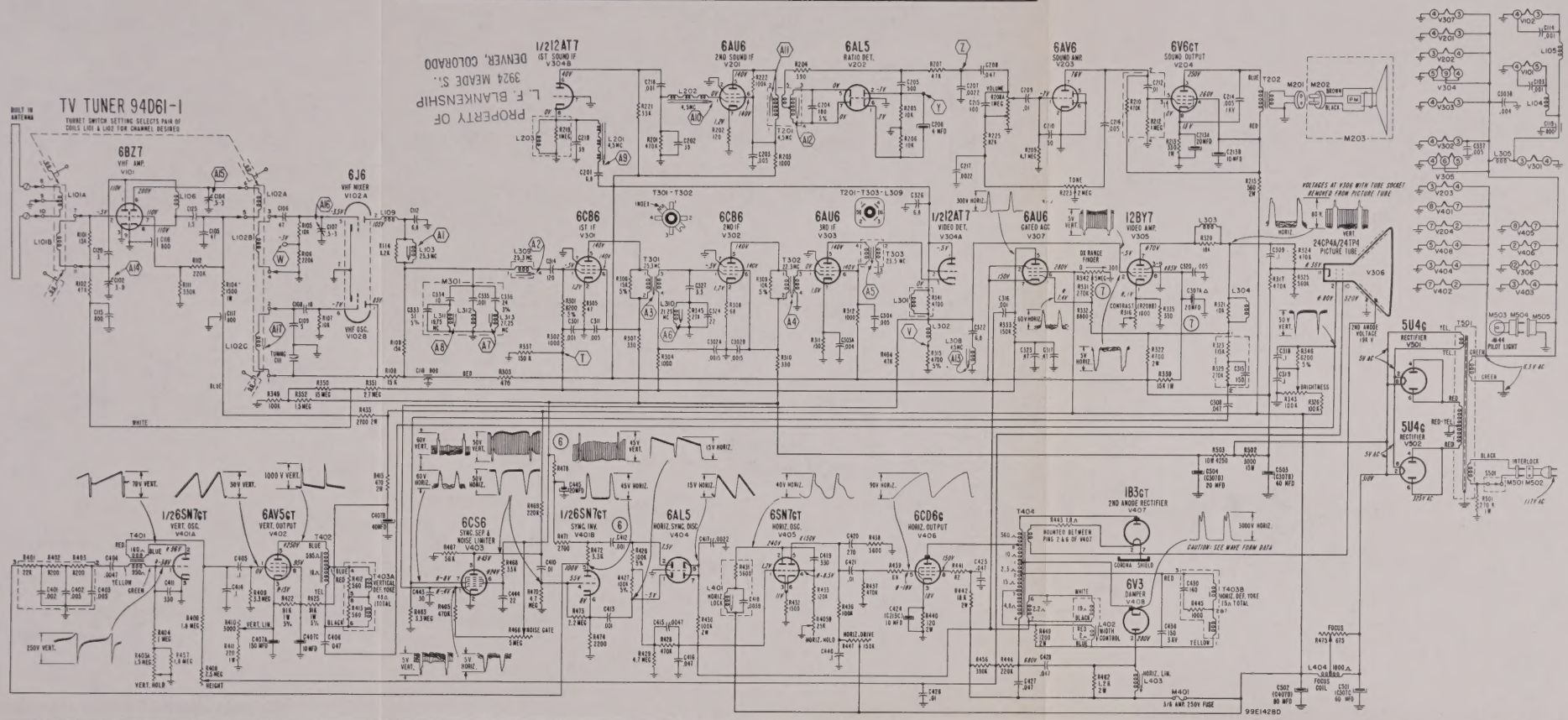
Schematic Diagram Courtesy of the Admiral Corp.

ADMIRAL CHASSIS 23E1AZ (Models C2516Z, C2517Z, H2516Z)

The PHOTOFACT Servicer

Set 375..Vol. 38 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ Oct. 15, 1957

Schematic Diagram Courtesy of the Admiral Corp.



SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 8 IN SET 343

Motorola Chassis TS-538, Y, VTS-538, Y, WTS-538, Y were covered in Photofact Folder 8 - Set 343.

Late in production many new models and late production changes were added.

Following is a complete list of all models and the chassis used in each.

MODEL	CHASSIS	MODEL	CHASSIS
Y21C7BG	TS-538Y	21C7BG	TS-538
Y21C7MG	TS-538Y	21C7MG	TS-538
Y21K54B	TS-538Y	21K54B	TS-538
Y21K54M	TS-538Y	21K54M	TS-538
Y21K56B	WTS-538Y	21K56B	WTS-538
Y21K56M	WTS-538Y	21K56M	WTS-538
Y21K57B	WTS-538Y	21K57B	WTS-538
Y21K57M	WTS-538Y	21K57M	WTS-538
Y21K57MCH	WTS-538Y	21K57MCH	WTS-538
Y21K58B	WTS-538Y	21K58B	WTS-538
Y21K58M	WTS-538Y	21K58M	WTS-538
Y21K59B	VTS-538Y	21K59B	VTS-538
Y21K59M	VTS-538Y	21K59M	VTS-538
Y21K59MCH	VTS-538Y	21K59MCH	VTS-538
Y21K67B	TS-538Y	21K67B	TS-538
Y21K67M	TS-538Y	21K67M	TS-538
Y21T33B	TS-538Y	21T33B	TS-538
Y21T33BG	TS-538Y	21T33BG	TS-538
Y21T33CH	TS-538Y	21T33CH	TS-538
Y21T33MG	TS-538Y	21T33MG	TS-538
Y21T35B	TS-538Y	21T35B	TS-538
Y21T35M	TS-538Y	21T35M	TS-538
Y21T36B	WTS-538Y	21T36B	WTS-538
Y21T36M	WTS-538Y	21T36M	WTS-538
Y24K14B	VTS-538Y	24K14B	VTS-538
Y24K14M	VTS-538Y	24K14M	VTS-538
Y24T6B	VTS-538Y	24T6B	VTS-538
Y24T6B	VTS-538Y	24T6M	VTS-538

(Con't on Reverse Side)

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TS-538A-03	TO IMPROVE AGC STABILITY R45 is disconnected from the 145 voltage source and reconnected to the 245 voltage source.
TS-538A-03-1	COMPONENT CHANGES L32, 4.5MC trap, is changed to part #24B738942. C47 is increased from 27MMF to 33MMF.
TS-538A-04-1	TO IMPROVE HORIZONTAL SWEEP The horizontal sweep circuit has been revised. A partial schematic showing the new circuit is given in Fig. 1. L42, horizontal oscillator, is changed to part #1V741946.
TS-538A-05	TO PROTECT POWER TRANSFORMER AND ON-OFF SWITCH R116 is disconnected from the on-off switch and ground. R116 is then reconnected in parallel with C104. A 5 amp. @ 125V fuse is added between the on-off switch and the red-black primary lead of T1, power transformer.
TS-538A-06	COMPONENT CHANGE C100 and C101 are increased in voltage rating from 2000V to 3000V.
TS-538A-07	TO IMPROVE VERTICAL SWEEP C73 is increased from .003MFD to .0033MFD. C81 is decreased from .03MFD to .02MFD.
TS-538B-00	TO IMPROVE HORIZONTAL SWEEP The horizontal sweep circuit has been revised. A partial schematic showing the new circuit is given in Fig. 1. L42, horizontal oscillator, is changed to part #1V741946.
TS-538B-01	TO REDUCE 43MC INTERFERENCE L3, IF trap coil, is changed to part #24B742202. L4, antenna coils, is changed to part #24K742360. The antenna input network to the tuner has been revised. A partial schematic showing the new circuit is given in Fig. 2. With this change the tuner coding is changed to TT-83YB and applies to "Y" version chassis only.
TS-538B-02	TO ELIMINATE DC NOISE THRU VOLUME CONTROL A .01MFD @ 500V ceramic disc capacitor is added from the junction of R56 and C63 to the inner lead of the shielded cable connected to R1B, volume control.
TS-538B-03	COMPONENT CHANGE R110 is increased from 15K to 18K.
TS-538B-04	TO INCREASE RATIO DETECTOR TRANSFORMER STABILITY L39, ratio detector, is changed to part #24K735697 or 24B742247. When part #24K35697 is used, R51 is 47Ω and C58 is 470MMF. When part #24B742247 is used, R51 is 100Ω and C58 is 1000MMF. Also, a 90MMF ceramic disc capacitor must be connected across pins 1 and 2 of V10, ratio detector.
TS-538C-00	TO PROVIDE ADDITIONAL FUSING PROTECTION M2, fuse, is disconnected from L41 and reconnected between L43 and C1B. L41 is connected directly to the 245 voltage source.
"R" Suffix	"R" SUFFIX ADDED TO CHASSIS CODING Chassis with "R" suffix stamped as part of the chassis coding indicates that the horizontal output circuit change mentioned in TS-538B-03 above, is incorporated into that chassis.

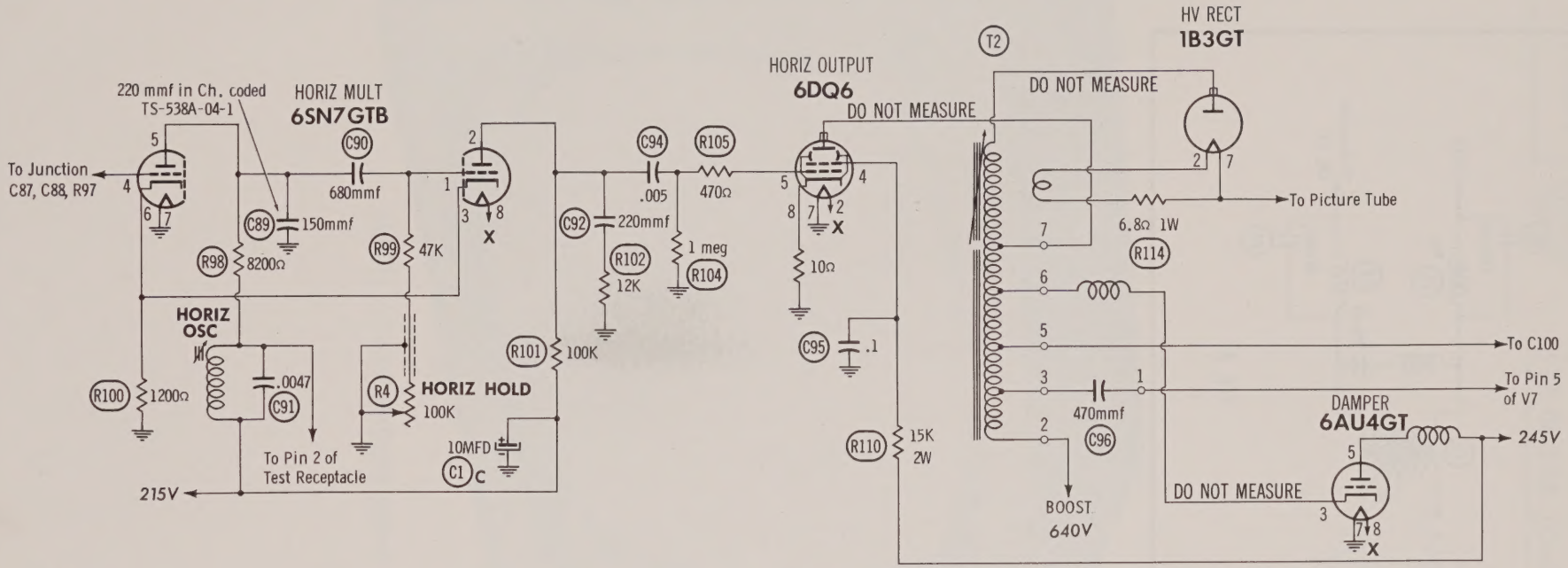

FIG. 1

(Con't on Reverse Side)

FOLDER 1

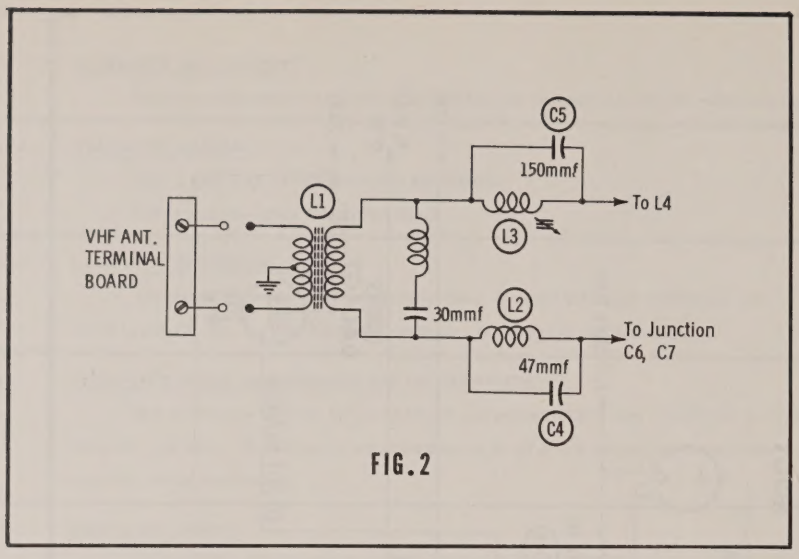
C5
150mmf
To L4
L1
L3
VHF ANT.
TERMINAL
BOARD
30mmf
L2
To Junction
C6, C7
47mmf
C4

FIG. 2

PHOTOFACT* Folder

*TRADE MARK

FIRESTONE 13-G-220, 13-G-221, 13-G-222, 13-G-223 (Code 334-6-A62/A, 334-6-N62/A)

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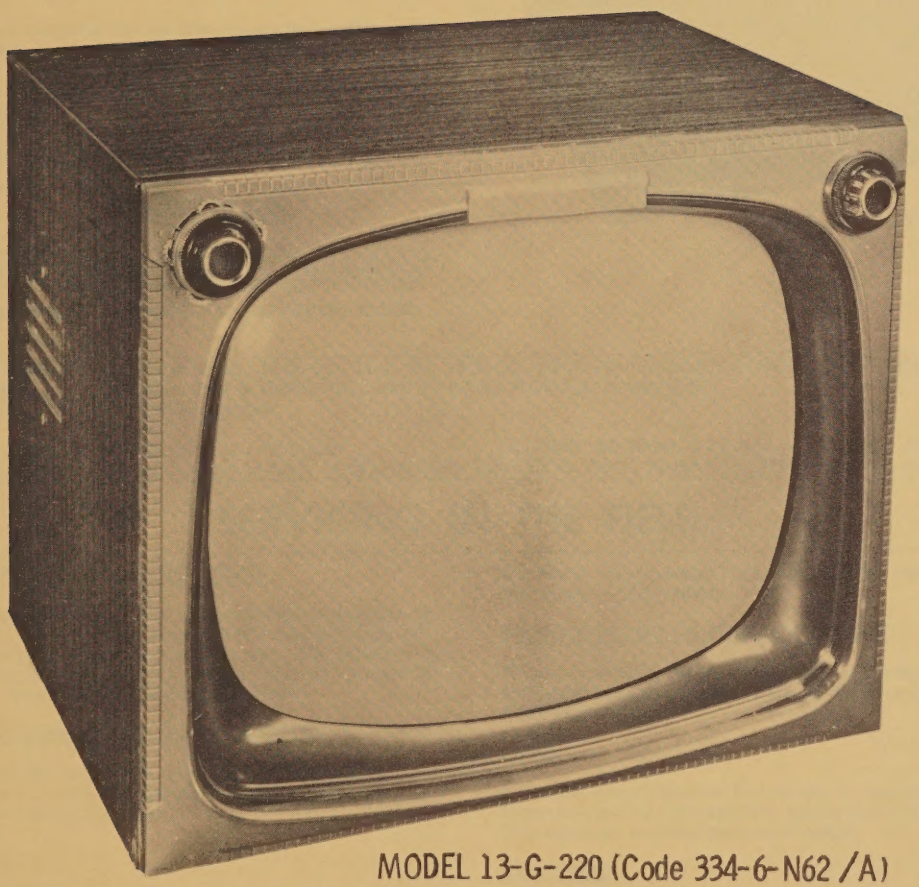

MODEL 13-G-220 (Code 334-6-N62/A)

FIRESTONE 13-G-220, 13-G-221, 13-G-222, 13-G-223 (Code 334-6-A62/A, 334-6-N62/A)

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FOLDER 2

PHOTOFACT* Folder
*TRADE MARK

FIRESTONE 13-G-220, 13-G-221, 13-G-222, 13-G-223 (Code 334-6-A62/A, 334-6-N62/A)

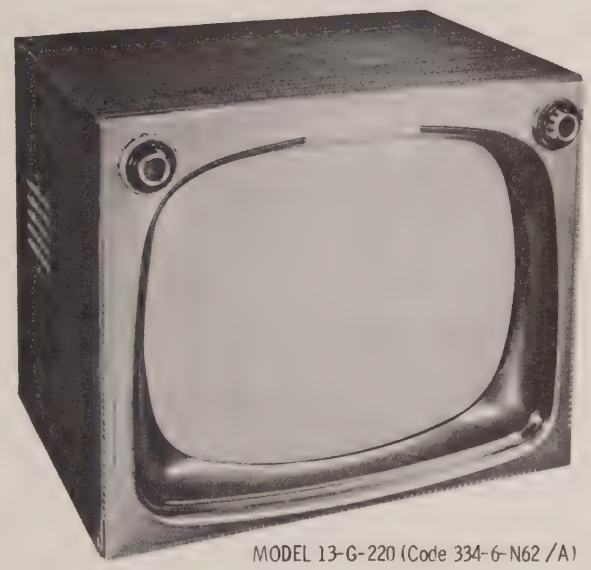
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 wood screws and the rear cover.
2. Remove 2 speaker leads.
3. Remove the antenna terminal board by loosening 2 wood screws.
4. Remove 2 metal screws holding the top of the chassis to the rear of the cabinet.
5. Remove 2 metal screws from inside the cabinet, holding the bottom of the chassis to 2 lower brackets.
6. Remove chassis by sliding out from the front of the cabinet.
7. Remove 4 speaker nuts and the speaker.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.



MODEL 13-G-220 (Code 334-6-N62/A)

TRADE NAME	Firestone Models 13-G-220, 13-G-221, 13-G-222, 13-G-223 (Codes 334-6-A62/A, 334-6-N62/A)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 155 Watts, 1.35 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

1. Remove the name plate by pulling straight out.
2. Remove 2 metal screws and the retainer bracket.
3. Remove the safety glass.

FOCUS

Adjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set the horizontal hold control to the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate audio detector buzz, adjust the buzz control for MINIMUM buzz and maximum sound. (For location see tube placement chart).

FUSES

A thermal circuit breaker is used for LV power supply protection and may be closed by means of a reset button. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

FIRESTONE 13-G-220, 13-G-221, 13-G-222, 13-G-223 (Code 334-6-A62/A, 334-6-N62/A)

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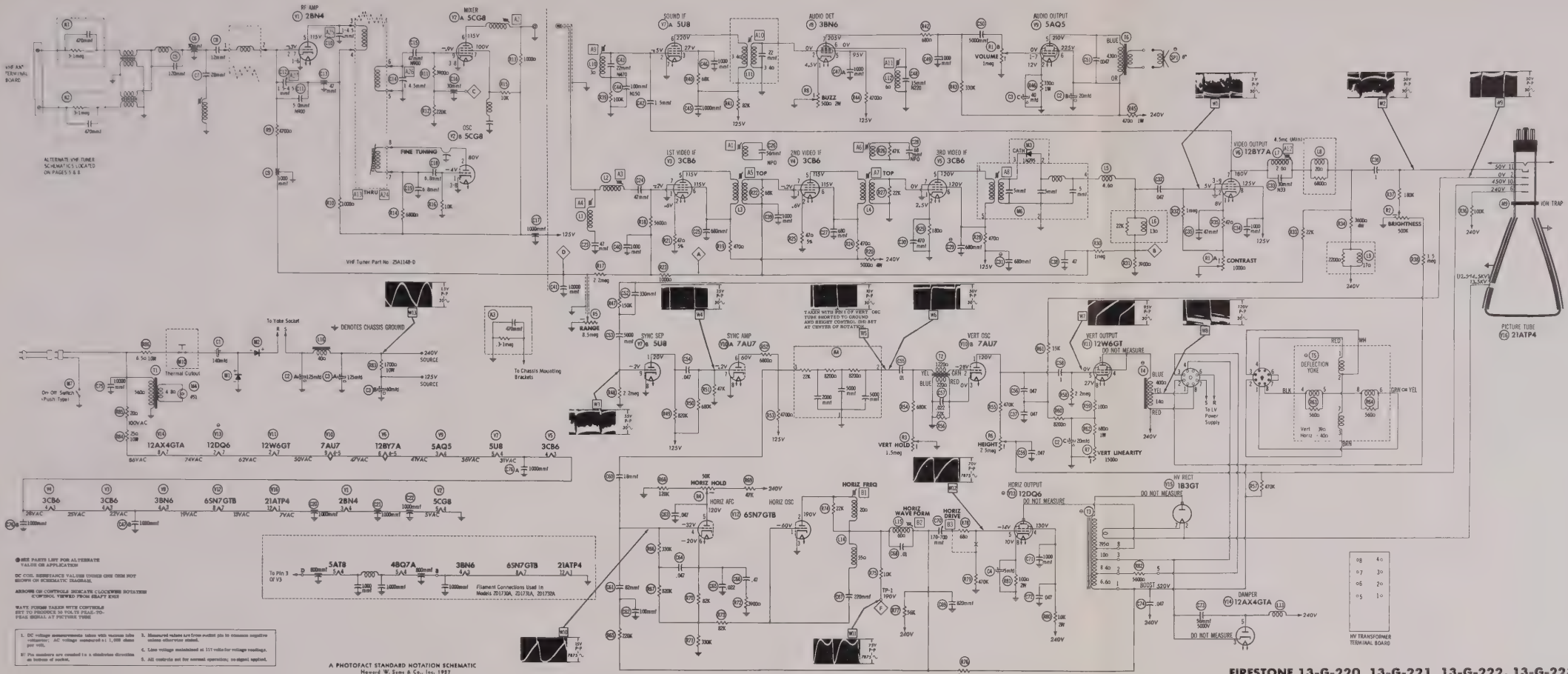
G921R

DATE 10-57 SET 375 FOLDER 2


RF AMP V1 2BN4
MIXER V2A 5CG8
OSC V2B 5CG8
SOUND IF V7A 5U8
AUDIO DET V8 3BN6
AUDIO OUTPUT V9 5AQ5
1ST VIDEO IF V3 3CB6
2ND VIDEO IF V4 3CB6
3RD VIDEO IF V5 3CB6
VIDEO OUTPUT V6 12BY7A
VHF ANT TERMINAL BOARD
ALTERNATE VHF TUNER SCHEMATICS LOCATED ON PAGES 5 & 8
VHF Tuner Part No. 25A1148-D
FINE TUNING
THRU
VOLUME
BUZZ
BRIGHTNESS
CONTRAST
RANGE
SYNC SEP V7B 5U8
SYNC AMP V10A 7AU7
VERT OSC V10B 7AU7
VERT OUTPUT V11 12W6GT
DO NOT MEASURE
VERT HOLD
HEIGHT
VERT LINEARITY
DEFLECTION YOKE
To Yoke Socket
DENOTES CHASSIS GROUND
On-Off Switch (Push Type)
Thermal Cutout
To Chassis Mounting Brackets
12AX4GTA V14
12DQ6 V13
12W6GT V11
7AU7 V10
12BY7A V6
5AQ5 V9
5U8 V7
3CB6 V5
3CB6 V4
3CB6 V3
3BN6 V8
6SN7GTB V12
21ATP4 V16
2BN4 V1
5CG8 V2
5AT8
4BQ7A
To Pin 3 Of V3
Filament Connections Used in Models 20173A, 20173A, 20173PA
HORIZ HOLD
HORIZ AFC
HORIZ OSC
HORIZ FREQ
HORIZ WAVE FORM
HORIZ DRIVE
HORIZ OUTPUT V13 12DQ6
DO NOT MEASURE
HV RECT V15 1B3GT
DO NOT MEASURE
BOOST 520V
DAMPER V14 12AX4GTA
HV TRANSFORMER TERMINAL BOARD
PICTURE TUBE V16 21ATP4
ION TRAP
4.5mc (Min.)
TAKEN WITH PIN 1 OF VERT OSC TUBE SHORTED TO GROUND AND BRIGHT CONTROL SHD SET AT CENTER OF ROTATION
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION
CONTROL VIEWED FROM SHAFT END
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction at bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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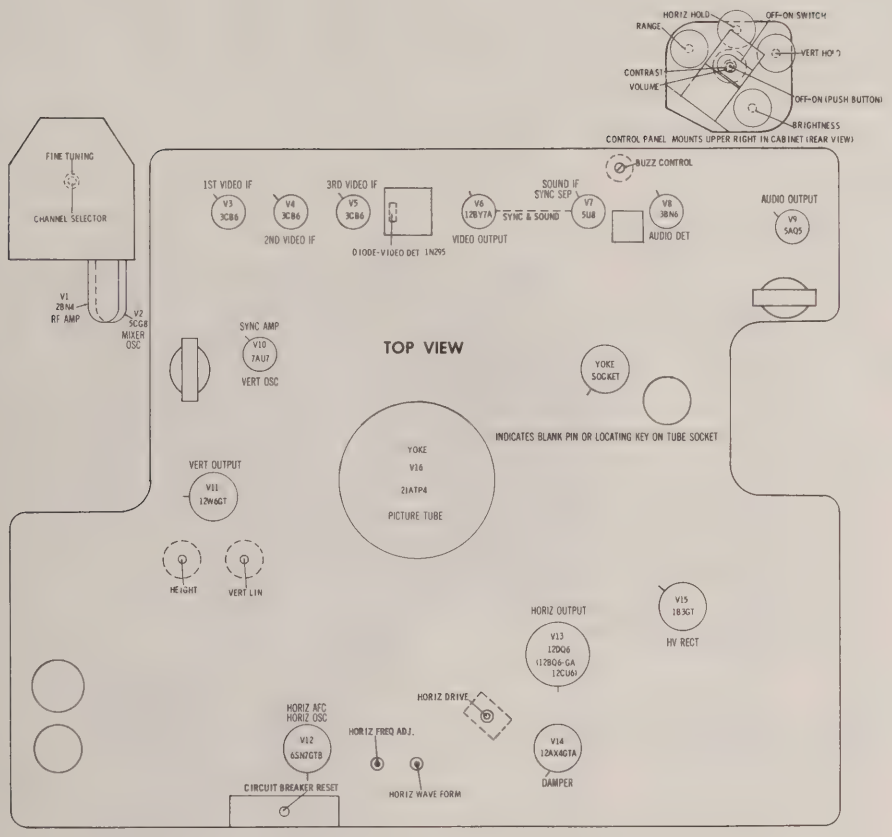
FIRESTONE 13-G-220, 13-G-221, 13-G-222, 13-G-223
(CODE 334-6-A62/A, 334-6-N62/A)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - Circuit Breaker (M10), Rectifier (M1, M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, Diode (M3), V6
No pic, no sound, has snow - V1, V2
No pic, has sound, has raster - V6, V16
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V7, V10
No horiz. sync - V7, V10, V12
No vert. or horiz. sync - V7, V10

SWEEP FAILURE
No raster, has sound - V12, V13, V14, V15, V16
No vertical deflection - V10, V11
Poor vert. linearity or foldover - V10, V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, M1, M2
Vert. off freq. - V10
Horiz. off freq. - V12

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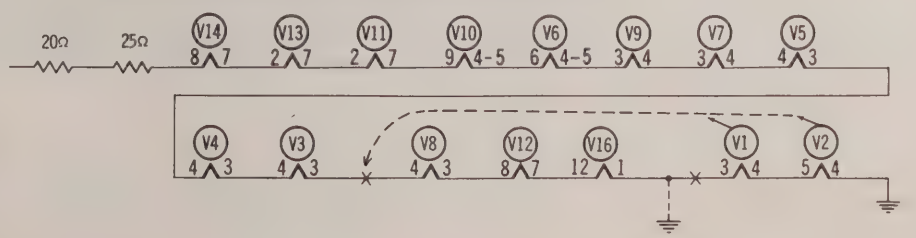
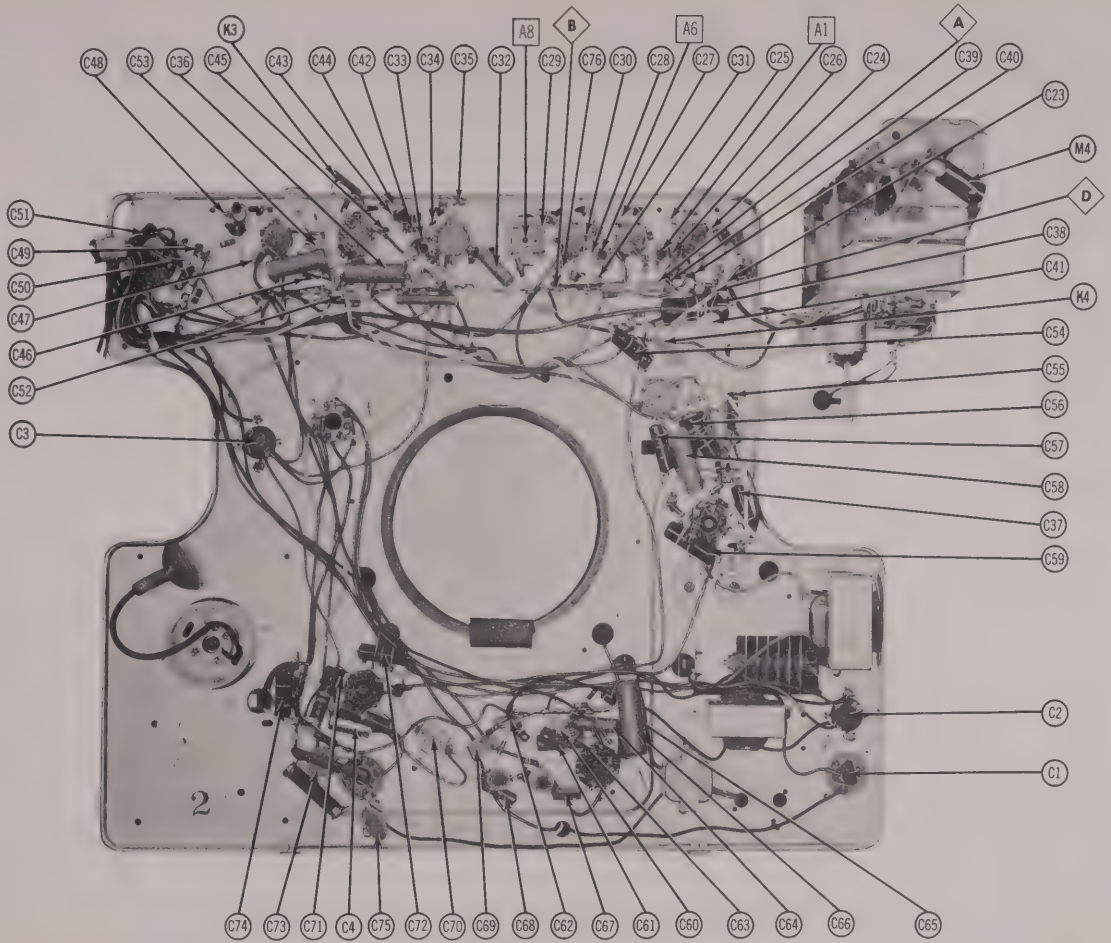
This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative.(See circuit below).





CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

ALTERNATE TUNER SCHEMATIC

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volts bias supply to point Ⓐ. For steps 3 thru 7 increase bias at point Ⓐ to 4.5 volts.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-oscillator tube (V2). Low side to chassis	44.5MC (10MC Swp)	47.25MC	Any non-interfering channel	Vert. Amp. thru detector (Fig. 1) to pin 5 (plate) of 3CB6 (V3). Low side to chassis.	A1	Adjust to place marker in trap notch as in Fig. 2.
2.	"	"	"	41.25MC 45.75MC	"	"	A2, A3, A4	Adjust for response curve similar to Fig. 2 with markers as indicated. A2 and A3 controls shape of curve top and positions 45.75MC marker. A3 positions 41.25MC marker. Both markers must be correctly positioned before proceeding with alignment.
3.	"	"	"	42.8MC	"	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis.	A5	Adjust sweep output for 2 volts at point Ⓑ. Adjust for maximum amplitude at marker.
4.	"	"	"	41.25MC	"	"	A6	Adjust for MINIMUM amplitude at marker.
5.	"	"	"	45.3MC	"	"	A7	Adjust for maximum amplitude at marker.
6.	"	"	"	44.0MC	"	"	A8	"
7.	"	"	"	41.25MC 42.4MC 42.8MC 44.0MC 44.5MC 45.3MC 45.75MC 47.25MC	"	"		Check for response curve similar to Fig. 3 with markers as indicated. If necessary SLIGHTLY retouch A1,and A4 thru A8 for desired reponse. DO NOT retouch A2 or A3.

SOUND IF ALIGNMENT

Turn the set on and tune in a TV station. Reduce the signal strength at the antenna terminals by using an attenuator or similar device until a "Hiss" is heard in the sound.
Adjust A9, A10, A11 and buzz control (R8) for maximum undistorted sound and MINIMUM buzz.
If the hiss disappears during alignment, reduce signal strength still further.

4.5MC TRAP ALIGNMENT

Use 0-10 volt scale on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to pin 2 (grid) of 12BY7A (V6). Low side to chassis.	4.5MC (Unmod)	Any non-interfering	DC probe to pin 11 (cathode) of picture tube. Common to chassis.	A12	Adjust for MINIMUM deflection.

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of 3 volt bias supply to point Ⓓ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	8		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT FOR TUNER #25A1148-D

Connect bias as under "VHF Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis.	A25, A26	Adjust A25 and A26 for response similar to Fig. 5 with markers on shoulders of curve.
11.	"	"	195MC (10MC Swp)	193.25MC 197.75MC	"	"	A27	Adjust for MINIMUM amplitude.
12.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel, make compromise adjustment of A25 and A26 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

VHF RF AND MIXER ALIGNMENT FOR TUNERS #25A1145 AND 25A1143

Connect bias as under "VHF Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10K to point Ⓔ. Low side to chassis.	A28, A29, A30	Adjust for response curve similar to Fig. 5, with markers above 90%.
14.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel, make compromise adjustments of A28, A29, and A30 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

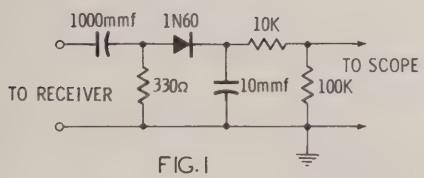


FIG. 1

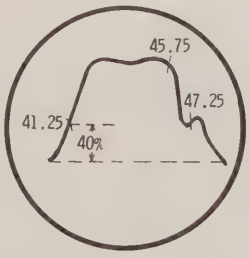


FIG. 2

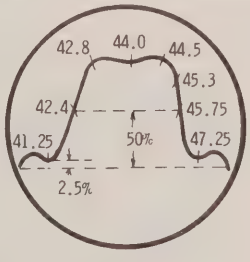


FIG. 3

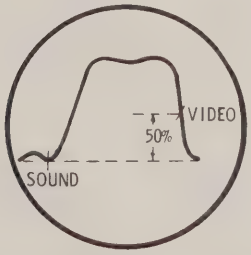


FIG. 4

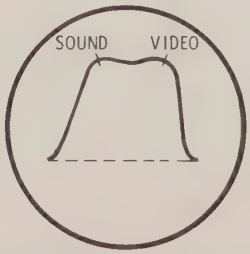
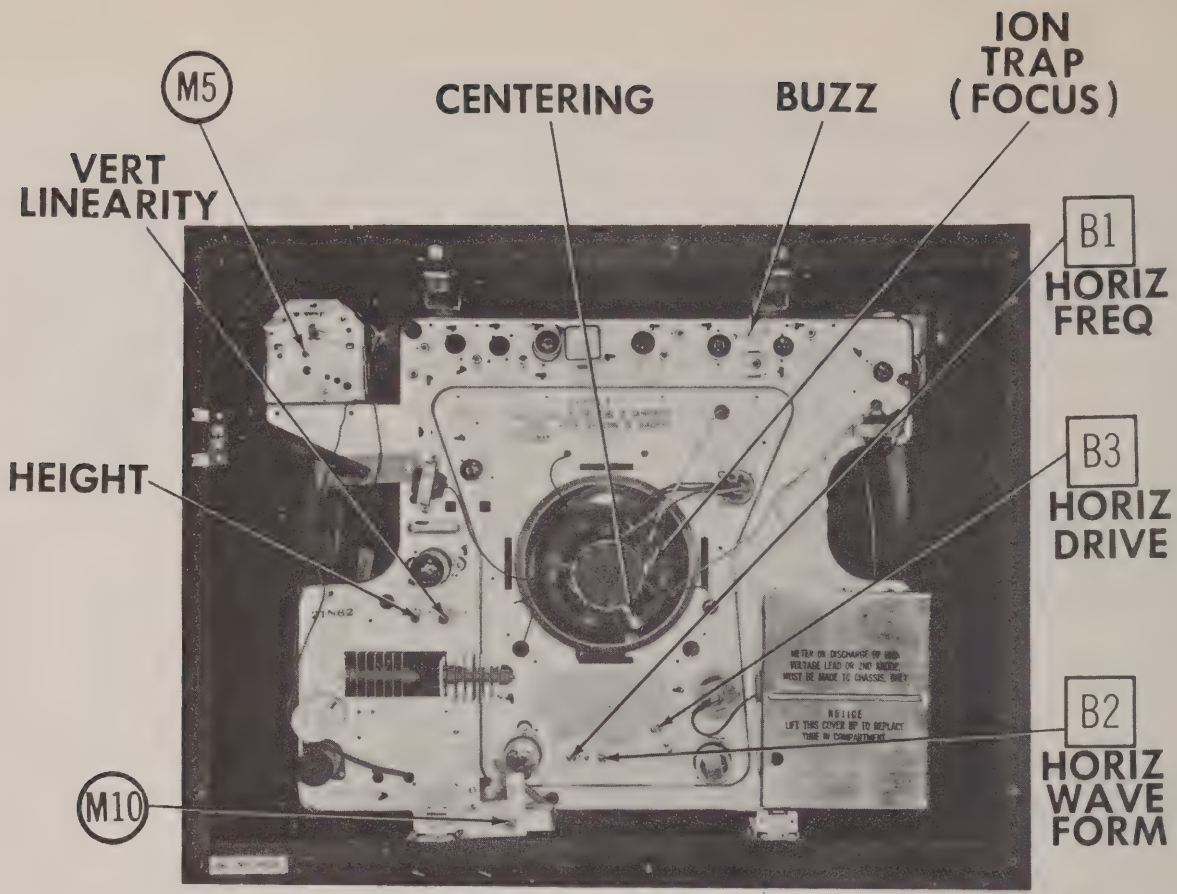


FIG. 5



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Turn the horizontal hold control to the center of its range.
Connect a short clip lead across the horizontal waveform coil (L15).
Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.
Remove the clip lead from L15. Connect the vertical amplifier of the scope thru a low capacity probe to point (F). Low side to chassis.
Adjust the horizontal waveform slug (B2) for equal peaks of round and sharp peaks of waveform as in Fig. 6. While making this adjustment, keep the picture in sync with the horizontal hold control and B1.
Adjust the horizontal drive trimmer (B3) clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.

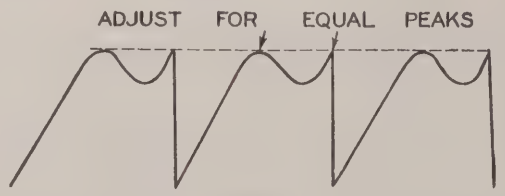
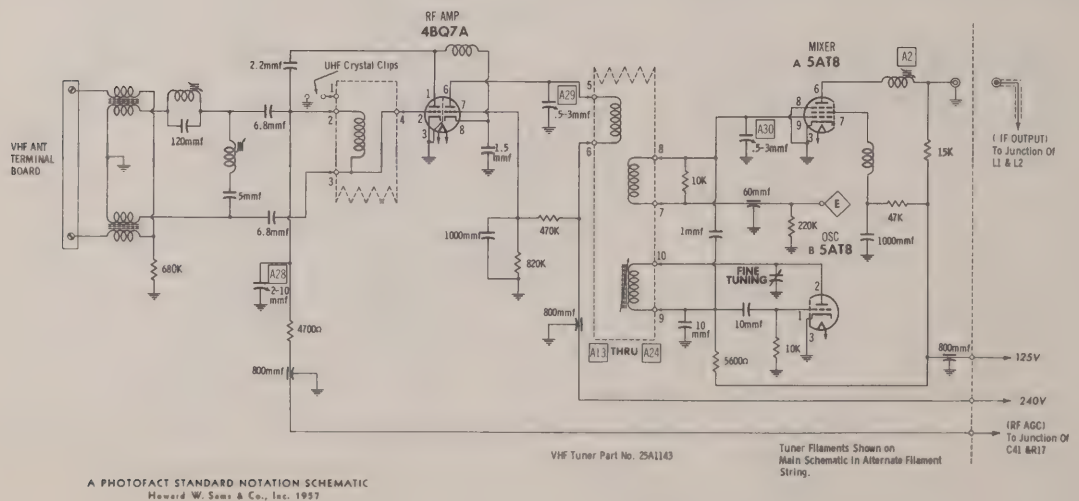


FIG. 6

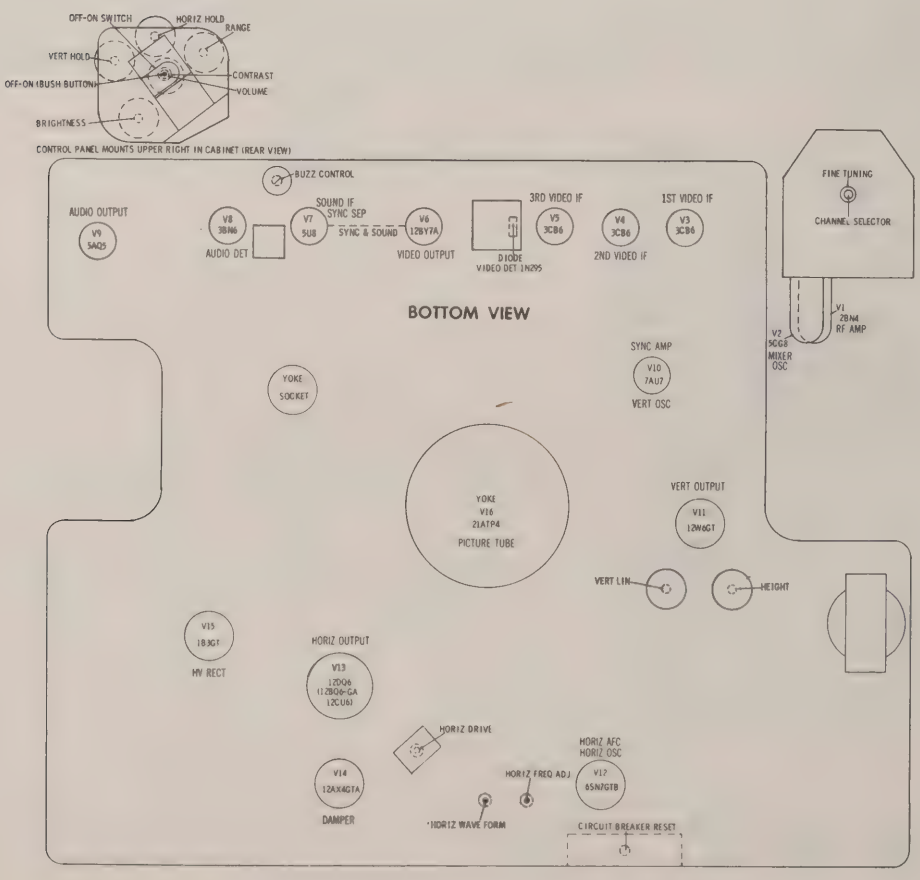


ALTERNATE TUNER SCHEMATIC

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2BN4	0Ω	2Meg	1.5Ω	1Ω	† 2700Ω	0Ω	1Meg		
V2	5CG8	10K	† 8500Ω	0Ω	0Ω	1Ω	† 2700Ω	† 12K	0Ω	220K
V3	3CB6	1Meg	47Ω	5Ω	6Ω	† 5500Ω	† 5500Ω	0Ω		
V4	3CB6	1Meg	47Ω	6Ω	7Ω	† 5500Ω	† 5500Ω	0Ω		
V5	3CB6	.1Ω	180Ω	7Ω	8.5Ω	† 2200Ω	† 2200Ω	0Ω		
V6	12BY7A	• 300Ω	1Meg	0Ω	13Ω	13Ω	14Ω	† 3700Ω	† 1700Ω	0Ω
V7	5U8	† 820K	100K	† 150K	8.5Ω	10Ω	† 82K	0Ω	0Ω	2.2Meg
V8	3BN6	• 450Ω	3.4Ω	4.5Ω	5Ω	† 6500Ω	6Ω	† 330K		
V9	5AQ5	55Ω	330Ω	13Ω	10Ω	† 950Ω	† 500Ω	55Ω		
V10	7AU7	‡ • 2.3Meg	• 1.1Meg	22K	14Ω	14Ω	† 13K	38K	0Ω	15Ω
V11	12W6GT	TP	17Ω	† 400Ω	† 400Ω	2.2Meg	TP	15Ω	• 1000Ω	
V12	6SN7GTB	400K	† 56K	0Ω	1.5Meg	• † 55K	400K	3Ω	4.5Ω	
V13	12DQ6	NC	20Ω	TP	† 10K	470K	TP	17Ω	100Ω	TOP CAP ‡ 10Ω
V14	12AX4GTA	TP	NC	¶	NC	† 40Ω	NC	20Ω	22Ω	
V15	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡305Ω
V16	21ATP4	1.5Ω	23K	PIN 6 † 100K	PIN 10 ‡470K	PIN 11 170K	PIN 12 3Ω			

† MEASURED FROM OUTPUT OF M 2.
‡ MEASURED FROM PIN 3 OF V14.
■ THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
TP TIE POINT
NC NO CONNECTION



TUBE PLACEMENT CHART

T6
C3
R2
M7
R5
R1
R68
R3
R4
T3
R82
B3
B2
TP1
F
R86
B1
M2
C1
C2
M1
T2
A4
A3
A5
A7
M3
M6
A12
A9
A10
A11
L11
DANGER
FRAGILE GLASS PICTURE TUBE IS DANGEROUS
TO SERVICE REFER SERVICING TO QUALIFIED
21N62
HORIZ WAVE
FORM 190V
CHASSIS TOP VIEW
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	2BN4	
V2	Mixer-Oscillator	5CG8	
V3	1st Video IF Amp.	3CB6	
V4	2nd Video IF Amp	3CB6	
V5	3rd Video IF Amp	3CB6	
V6	Video Output	12BN7A	
V7	Sound IF - Sync Sep	3U8	
V8	Audio Det	3DH6	

Note 1 Some versions may use a 12CU6 or 12BQ6GA in this application.

ITEM No.	USE	TYPE	NOTES
V9	Audio Output	7AQ5	
V10	Sync Amp - Vert Osc	7AU7	
V11	Vert Output	12W6GT	
V12	Horiz AFC-Horiz Osc	8SN7GT	
V13	Horiz Output	12DQ6	Note 1
V14	Damper	12AX4GTA	
V15	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA		NOTES
	FIRESTONE PART No.	GENERAL ELECTRIC PART No. / SYLVANIA PART No.	
V16	2.ATP4	21ATP4	1 Aluminized
		21ATP4A 1	2 Silver screen #5
		21ATP4A 2	
		21ATP4A 3	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	150	45X421	AF451-23	XA0261	FP1U1	TMS-24	MT-15150	TVL-1420
C2A	125	300	45X431	AF454-0260	DD049	FP2U8 LT-126	TMT-26		E2B78 *
B	20	300							
C	20	50							
C3A	125	300	45X420	AF883-09-82	DD040 LBR305	FP575 4 LT-60			TVL-3574. 6
B	20	300							
C	40	50							
C4	5	50	45X418	PR50V5	BHR5 50	TC30	TD-5-50	MT-0504	TVA-1503

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							
	CAP	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		NOTES
C5	130			BPD-00012	DD-121	LUU12	ED-120	UC-5512	5GA-T12	
C6	30									
C7	30									
C8	12									
C9	1000		EF-001	MFT-1000				503C-DI		
C10	4 | 5			839-5		532-B				N900
C11	5 | 2									
C12	4 | 5			839-5		532-B				
C13	47									
C14	4 | 5			839-5		532-B				
C15	47									
C16	30									
C17	1000		EF-001	MFT-1000				503C-DI		
C18	6 | 8									
C19	6 | 8									
C20	1000		EF-001	MFT-1000				503C-DI		
C21	1000		EF-001	MFT-1000				503C-DI		
C22	1000		EF-001	MFT-1000				503C-DI		
C23	47	47X903	S1 47	D6-470	LT6Q47	ED-47	UC-5447	SGA-047		
C24	47	47X903	S1 47	D6-470	LT6Q47	ED-47	UC-5447	SGA-047		
C25	680	80X5	BPD-20068	D5-681	LUT68	ED-680	UC-5368	5GA-T68		
C26	58		NPO-S1 58	TCZ-58	C10Q58C	TCO-58				NP0
C27	680	80X5	BPD-20068	DD-681	LUT68	ED-680	UC-5368	5GA-T68		NP0
C28	68		NPO-S1 68	TCZ-68	C10Q68C	TCO-68		STCC-C68		Note 1
C29	680	80X5	BPD-20068	DD-681	LUT68	ED-680	UC-5368	5GA-T68		
C30	470	80X4	BPD-20047	DD-471	AT5U47	ED-470	UC-5347	5GA-T47		
C31	680	80X1	BPD-20068	DD-681	LUT68	ED-680	UC-5368	5GA-T68		Note 2
C32	0.047	200	BPD-P-303	CUB2B47			UTM-2147	STM-S47		
C33	30		47X569							N33
C34	1000		80X1	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C35	47		47X928		D6-470	LT6Q47	ED-47	UC-5447	SGA-047	
C36	47	400	RCP10M4047M	P4S8N-4	DF-404	CUB4D7		GEM-4D7	4TM-P1	
C37	0.047	400	RCP10M4473M	P4S8-47	DF-503	CUB3A47		GEM-3147	STM-S47	
C38	47	200	RCP10M3447M	P3S8N-47		CUB2P47		GEM-3047	STM-P47	
C39	1000		80X1	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C40	1000		80X1	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C41	10000		47X595	BPD-01	DD-103	BYA6S1	ED-01	DC531	5HK-S1	
C42	1.3		47X534	NPO-S1 1.5	TCZ-1R5		TCO-1 5	ZT-5515	STCCB-V15	
C43	22		47X571							N470
C44	100		47X58							N150
C45	1000		80X1	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C46	1000		80X1	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C47A	1000		80X3	BPD-3X001	DD2-103	BYC5DD1	ED2-001	DCDB21	5HK-S1K	
B	1000									
C48	22		47X573							N330
C49	1000		80X1	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C50	5000		47X507	BPD-005	DD-502	BYA5D5	ED-005	DC525	5HK-D5	
C51	.0047	800	RCP10M4472M	BPD-0047	D6-472	CUB6D47	ED-0047	GEM-6247	STM-D47	
C52	1000		47X570	1464-00033		1RS7Z3			1464-00033	
C53	5000		47X507	BPD-005	DD-502	BYA5D5	ED-005	DC525	5HK-D5	
C54	047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C55	01	400	RCP10M403M	BPD-03	DF-303	CUB4S33	GP-10000	GEM-4S3	4TM-S33	
C56	047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C57	022	200	RCP10M2233M	BPD-03	DF-303	CUB3S33		GEM-3133	4TM-S33	
C58	1	400	RCP10M104M	P4S8N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C59	047	600	RCP10M4473M	BPD-05	DF-503	CUB6S47		GEM-6147	4TM-S47	
C60	18		RCM25B180K	1464-00018		1RS018			MS-418	
C61	82		RCM20B820K	1464-00082		1RS082			MS-482	
C62	330		RCM30B331K	1464-00081		1RS7Z1			MS-381	
C63	047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C64	047	200	RCP10M4473M	BPD-05	DF-503	CUB2S47		GEM-3147	4TM-S47	
C65	022	200	RCP10M2233M	BPD-03	DF-303	CUB2S22	ED-02	GEM-3122	4TM-S22	
C66	47	200	RCP10M474M	P2S8N-47		CUB2P47		GEM-3047	4TM-P47	
C67	220		RCM20B221K	1464-00022		1RS722			MS-322	
C68	01	400	RCP10M403M	BPD-01	DF-103	CUB4S1	ED-01	GEM-4U	4TM-S1	
C69	820		RCM20B821K	1464-00082		1RS782			MS-382	
C70	170-700		17A27I							
C71	1000		80X1	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C72	047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C73	56	5000	47X705		D5D0-560					
C74	047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C75	10000		47X581	BPD-01	DD-103	BYA8S1	ED-01	DC531	5HK-S1	

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C76A	1000		80X3	BPD-3X001	DD3-102	BYC5DD1	ED2-001	DCDB21	5HK-S1K	
B	1000									

Note 1 Some versions use a 560MMF in this application.
Note 2 Some versions use a 1000MMF in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1000Ω	½	78X25					Contrast
B	1Meg	½						Volume
R2A	500K	½	40X415	AB-59	A47-500K-S	Q11-133	U50	Brightness
B	Shaft			AK-8	NQ	D8-37		
R3A	1 5Meg	½	40X415	AB-742	A47-1.5Meg-S	Q11-138	U55	Vert. Hold
B	Shaft			AK-9	NQ	D8-37		
R4A	50K	½	40X414	AB-31	A47-50K-S	Q11-123	U36	Horiz. Hold
B	Shaft			AK-8	R3-116	NQ	D8-37	
R5	2 5Meg	½	40X417					
R6A	2 5Meg	½	40X396	BX-83	A47-2 5Meg-S	Q11-239	TA255L	
B	Shaft			Not Req	FXQ-1/2	TQ	Not Req.	
R7A	1500Ω	½	40X399	B-8	A47-1500-S	Q11-109	PTA152L	Vert. Lin.
B	Shaft			Not Req.	FXS-1/2	TQ	Not Req.	
R8	500Ω	2	40X397		FXS-1/2		FZ-600	Buzz

* The resistance of this control will vary from 7 to 10 megs

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.		
R9	4700Ω		BTS-4700			
R10	1000Ω		BTS-1000			
R11	1800Ω		BTS-1800			
R12	220K		BTS-220K			
R13	1000Ω		BTS-1000			
R14	8800Ω		BTS 8800			
R15	10K		BTS-10K			
R16	10K		BTS-10K			
R17	2 2Meg		BR4225			
R18	5600Ω		BR4562			
R19	470Ω		BR471	BTS-470		
R20	5000Ω	4	4X332	PW4-5000		
R21	47Ω 5%		BR4709	BTS-47 5%		
R22	68K		BR4683			
R23	1000Ω		BR5109			
R24	470Ω		BR471	BTS-470		
R25	470Ω 5%		BR4709	BTS-47 5%		
R26	47K		BR4473			
R27	22K		BR4223	BTS-22K		
R28	470		BR471	BTS-470		
R29	180Ω		BR4181	BTS-180		
R30	1Meg		BR4105	BTS-1Meg		
R31	3900Ω		BR4392	BTS-3900		
R32	1Meg		BR4105	BTS-1Meg		
R33	22K		BR4223	BTS-22K		
R34	3600Ω	4	4X331			
R35	470		BR470	BTS-47		
R36	100K		BR4104	BTS-100K		
R37	180K		BR4184	BTS-180K		
R38	1 5Meg		BR4155	BTS-1 5Meg		
R39	100K		BR4104	BTS-100K		
R40	68K		BR4683	BTS-68K		
R41	82K		BR4823	BTS-82K		
R42	680Ω		BR4681	BTS-680		
R43	330K		BR4334	BTS-330K		
R44	47000		BR4473			
R45	470Ω	1	CB471	BTA-470		
R46	330Ω	1	CB4Z1	BTA-330		
R47	180K		BR4184	BTS-180K		

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.		
R48	2.2Meg		BR4225	BTS- 2.2Meg		
R49	820K		BR4824	BTS-820K		
R50	680K		BR4684	BTS-680K		
R51	47K		BR4473	BTS-47K		
R52	68000		BR4683	BTS-6800		
R53	4700Ω		BR4474	BTS-4700		
R54	680K		BR4684	BTS 680K		
R55	470K		BR4474	BTS-470K		
R56	22K		BR4223	BTS-22K		
R57	470K		BR4474	BTS-470K		
R58	2.2Meg		BR4225	BTS- 2.2Meg		
R59	100Ω		BR4101	BTS-100		
R60	6200Ω		BR4622	BTS-6200		
R61	15K		BR4153	BTS-15K		
R62	680Ω	1	C6680	BTA-680		
R63	560Ω					
R64	560Ω					
R65	220K		BR4224			
R66	330K		BR4334			
R67	820K		BR4824			
R68	180K		BR4184			
R69	47K		BR4473	BTS-47K		
R70	82K		BR4823			
R71	33K		BR4334			
R72	3900Ω		BR4392			
R73	82K		BR4823			
R74	22K		BR4223			
R75	10K		BR4103	BTS-10K		
R76	1Meg		BR4105	BTS-1Meg		
R77	56K		BR4563	BTS-56K		
R78	68Ω		BR5680	BTS-68		
R79	470K		BR4474	BTS-470K		
R80	10K	3	BR4103	BTS-10K		
R81	100Ω	2	BR4101	BTS-100		
R82	5600Ω	10	BR4563	BTS-5600		
R83	10K	10	43X394	1 5/4A-10K		
R84	25Ω	10	43X390	PW10-25		
R85	20Ω	2	43X393			
R86	6.5Ω	10	43X393			

TRANSFORMER (MISC.)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	6.3V			54X07 1	F55U 3/2	P-2944 3 2	P-8134 3 2	21F08 3/2	F-13X 2
	0A	2A								

1 54X08 alternate part number
2 Drill one new mounting hole.
3 Tape center tap on secondary winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Osc.	54X10	BH702	A-3003	2997 1	V105	A-8155	26A03	A-97X
T3	Horiz. Output	53X359A	53X359A	FP49 3	32ST1 2	X094 1	RO-333 *	FLY-18D	D-50 1
				* 1	* 1	* 1		* 1	* 1
	Alt. Horiz. Output	53X359							
T4	Vert. Output	51X173A	Z1900 2/3	A-2823 1		V302 2/3	A-8149 2	26S75 2/3	A-118X 1
				2					2
	Alt. Vert Output	51X173	Z1900 2/3	A-2923 1		V302 1/3	A-8148 2	26S75 2/3	A-118X 1
				2					2
T5A	Yoke-Horiz. (24MH)	9A2387-1B	DF807 3/5	MDF-92 1	2350 3/5	Y90719/43	DY-16A 3	Y-18 3/5	Y-44 &
B	(90°) Vert. (39MH)			3		3/5			NWL 3/5
	Alt. Yoke	9A2367	DF807 3/5	MDF-91 1	2351 3/5	Y90719/43	DY-16A 3	Y-18 3/5	Y-44 &
				3		3/5			NWL 3/5
M8	Yoke Rear Cover & Centering Device	3A425							YCL
	Yoke Clamp	30X81							CL1

1 Drill new mounting hole(s)
2 Use 8 to 1 turns ratio.
3 Connect as auto transformer.
4 Cut and tape green lead.
5 Mount with leads out top and connect same as original using original horizontal damping network.
6 Use original rear cover and centering device.
* This part may be superseded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL (CONNECTION)	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	B	9	9	9	9	8	9	9
	3	7 or 5	7 or 5	7 or 5	7 or 5	3	7 or 8	7 or 8
	2	See Note 7 NC	See Note 7 NC	See Note 7 NC	See Note 7 NC	8	See Note ① NC	See Note ① NC
	1	1	1	1	1	1	1	1
Special Notes		①	①	①	①	①	①	①

① Install new damping network, consisting of approx. 100MMF ② 2KV and 1000Ω ③ 1 watt, across horizontal yoke terminals #3 and #7.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI	SEC	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	6200Ω	6-8Ω	51X180	Z1000 1	A-2900 1	A-3357	24S80 1	6-51X 1	1 Drill one new mounting hole. Tape center tap on primary winding.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C IMP	FIRESTONE PART No.	QUAM PART No.	
EP1	6" 5"	PM PM	6-8Ω 6-8Ω	12A558 12A540 ①	6A1527 5A0782Z6 4	① Alternate part number

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	IF Coupling Coil	9A3369			6235	
L2	Ist. Video IF	9A3565		TV-181	6235	
L3	2nd. Video IF	9A3563			6232	Includes 47 25MC trap and Cap.
L4	3rd. Video IF	9A3564			6231	Includes 47 25MC trap, cap. and resistor.
L5	Tweet Choke	9A3375				80 Microhenries
L6	Shunt Peaking Coil	36A13	19-3160 *	TV-184 *	6180 *	160 Microhenries, wound on 33K resistor
L7	4.5MC Trap	9A3566	20-1004	TV-181	1469	
L8	Series Peaking Coil	36A38		TV-180 ▲	6181 ▲	350 Microhenries, wound on 6800Ω resistor
L9	Shunt Peaking Coil	36A33	19-3380 *	TV-185 *	6181 *	235 Microhenries, wound on 2200Ω resistor
L10	Ist. Sound IF	9A3366	20-1004	TV-181	1469	
L11	2nd. Sound IF	9A3368	17-3496	TV-182	6303	Includes 32MMF Cap.
L12	Quadrature Coil	9A3367	20-1005	TV-181	1460	
L13	RF Choke	9A3380	19-1001		6804	1.5 Microhenries

* Parallel with 33K resistor.
▲ Parallel with 6800Ω resistor.
● Parallel with 2200Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA							NOTES
	PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L14	75Ω		9A3571						HS-7 *	Tapped @ 55Ω, 12.4 to 48.5 Millihenries
L15	60Ω	0.3Ω	9A3573							Horiz. Freq 7.5 to 30 Millihenries
										Horiz. Waveform

* Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D C RESISTANCE	INDUCTANCE @ CURRENT 1000 ^C/_A	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16	265A	40Ω	7 HY	53X95-2	C8037 1	C-2996 1	C-2326 1	26C44 1	C-27X

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	FIRESTONE PART No.	REPLACEMENT DATA	
K2	Ant Input	470MMF, 3-1Meg	76X01	Centralab	RC-471
K2	Ant Input	470MMF, 3-1Meg	76X01	Centralab	RC-471
K3	Chassis Isolation	470MMF, 3-1Meg	76X01	Centralab	RC-471
K4	Vert Integrator	3000MMF, 5000MMF, 5000MMF, 22K, 82000, 82000	76X7	Aerovox Centralab Cornell Dubilier Erie Sprague	PA20 PC-100 BH7M3 1469-1 Y-1

RECTIFIERS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CURRENT (Measured)		FIRESTONE PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.265A		56X06 ①	1090A 1	1N1007 2	RS3008L 1	6S300A 1	300 ①	
M2	.265A		56X06 ①	1090A 1	1N1007 2	RS3008L 1	6S300A 1	300 ①	

① Selenium type. ② Germanium type.

FOLDER 2

FIRESTONE 13-G-220, 13-G-221, 13-G-222, 13-G-223 (Code 334-6-A62/A, 334-6-N62/A)

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		FIRESTONE PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N295 *		1N60	1N60	Video Det. (Pigtail)

* A CK706 or 1N60 may be used in this application.

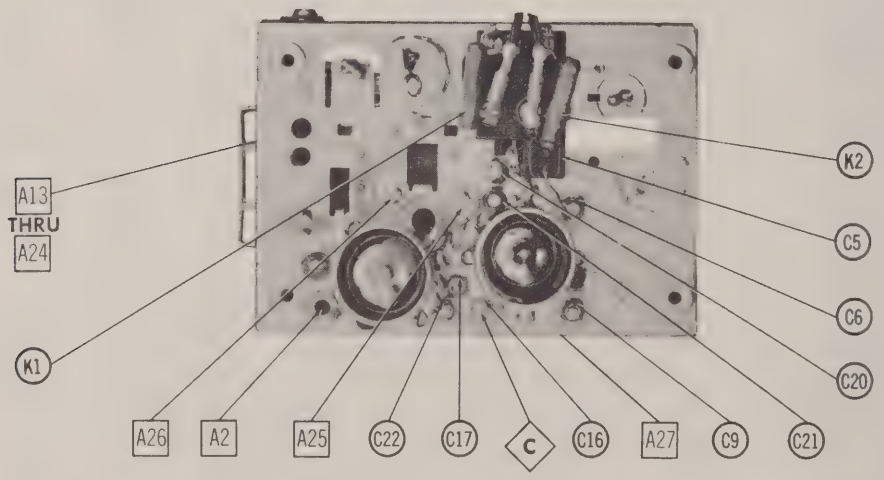
MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M4	Dial Light		#51 Type (A type #15 may be used in some versions)
M5	Tuner	25A1148-D	VHF
	Tuner	25A1145	UHF-VHF
	Tuner	25A1143	VHF
M6	Video Det. Assy.	9A2370	Includes 4th. Video IF, peaking coil, caps., M3
M7	Switch	2A464	On-off (Push type)
M8	Centering Device	2A435	Includes rear yoke cover
M9	Ion Trap	2A421	
M10	Circuit Breaker	2A461	

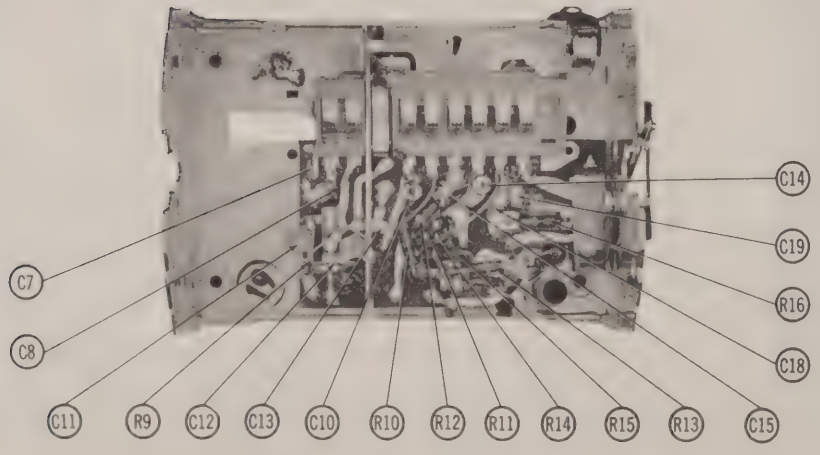
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

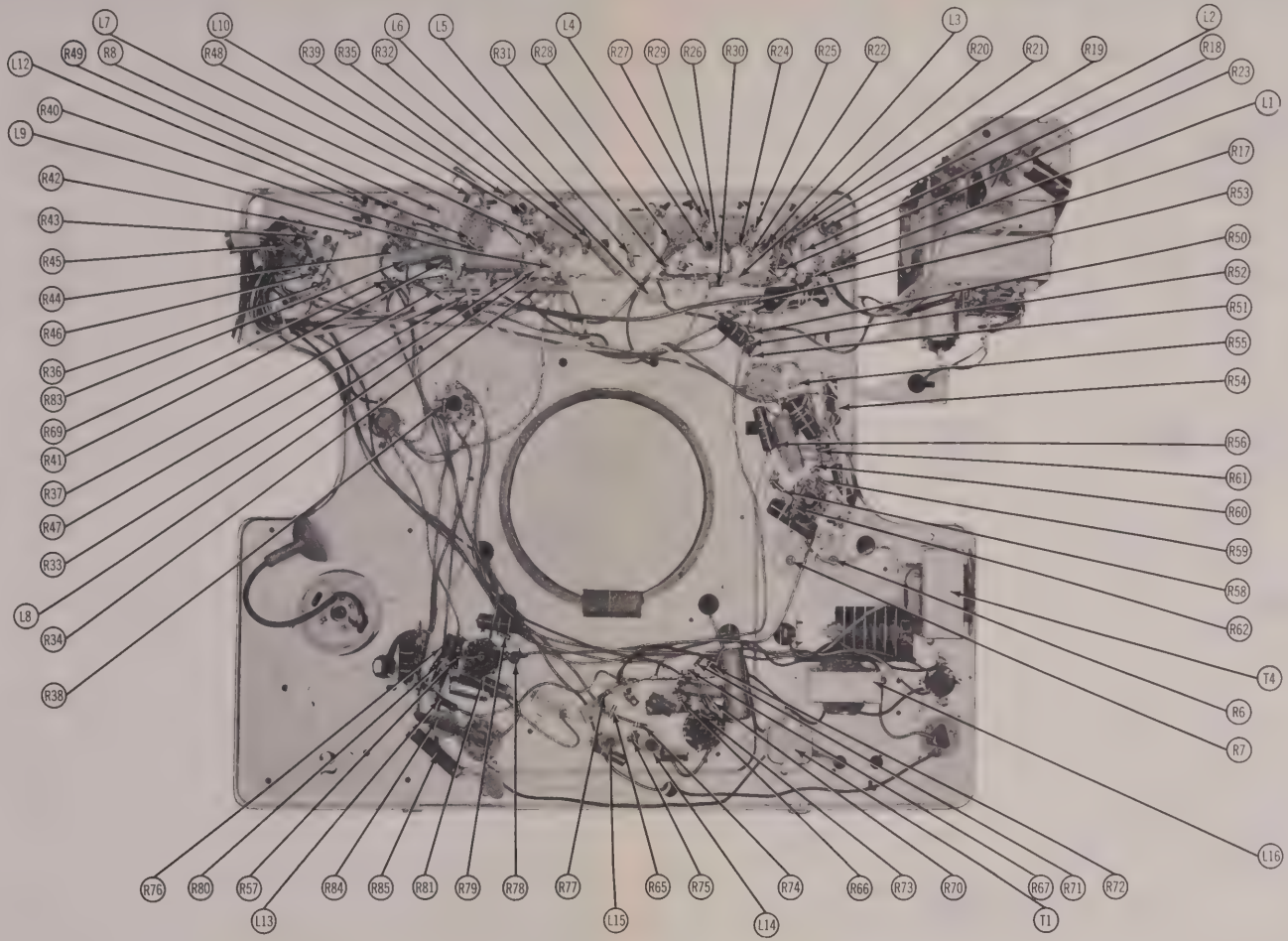
NAME	PART NO.	DESCRIPTION
Safety Glass	17X193-1	Tinted
Knob	10A861-1	Control (4 used)
Knob	10A870-11	Channel Selector (VHF, Mahogany Cabinet)
Knob	10A871-1	Fine Tuning (VHF, Mahogany Cabinet)
Knob	10A872-1	Volume (VHF, Mahogany Cabinet)
Knob	10A873-1	Contrast (VHF, Mahogany Cabinet)
Knob	10A870-12	Channel Selector (VHF, Oak Cabinet)
Knob	10A871-2	Fine Tuning (VHF, Oak Cabinet)
Knob	10A872-2	Volume (VHF, Oak Cabinet)
Knob	10A873-2	Contrast (VHF, Oak Cabinet)



RF TUNER TOP VIEW



RF TUNER BOTTOM VIEW



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

MAGNAVOX CHASSIS U74-01AA, U74-02AA, V74-01AA, V74-02AA

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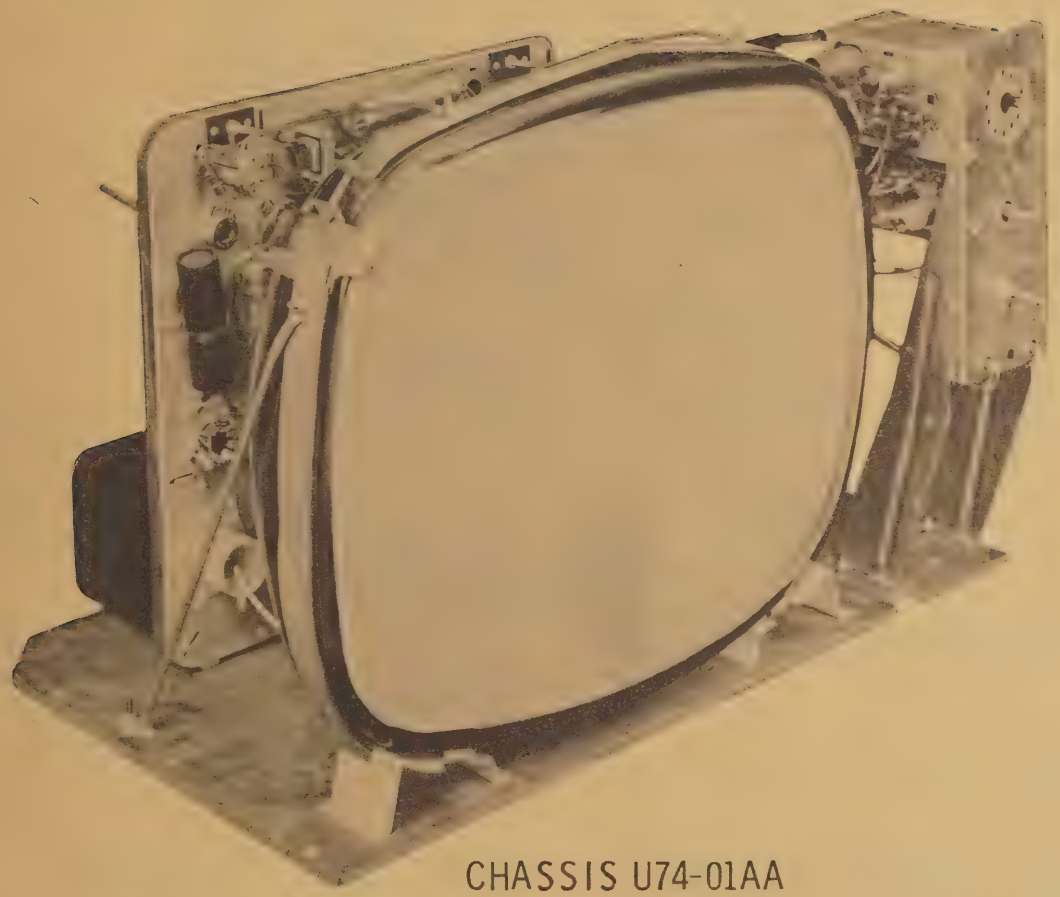
3924 MEADE St.
DENVER, COLORADO



CHASSIS U74-01AA

MAGNAVOX CHASSIS U74-01AA, U74-02AA, V74-01AA, V74-02AA

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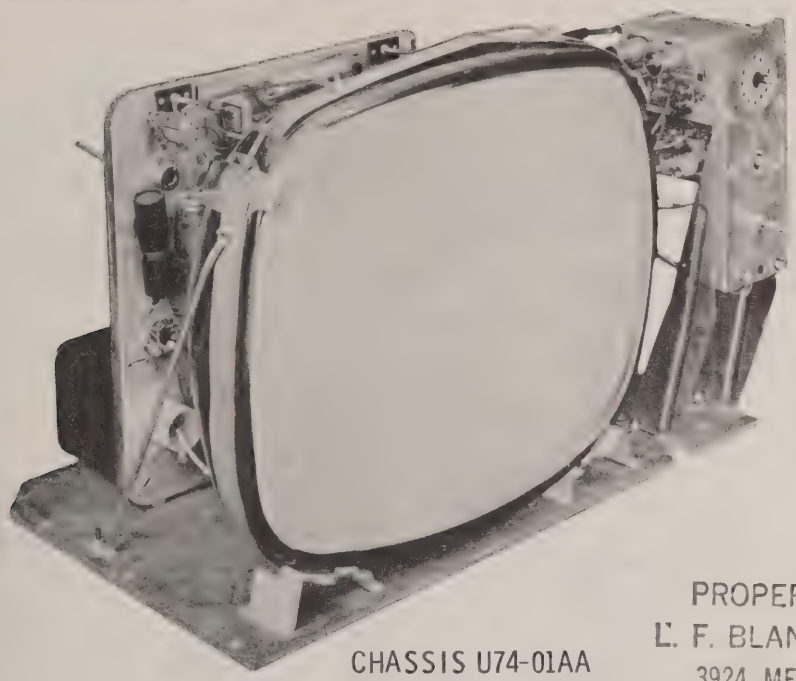
DATE 10-57 SET 375 FOLDER 3

FOLDER 3

MAGNAVOX CHASSIS U74-01AA, U74-02AA, V74-01AA, V74-02AA



CHASSIS U74-01AA

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

TRADE NAME	Magnavox Chassis U74-01AA, U74-02AA, V74-01AA, V74-02AA (74 Series)
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana
TYPE SET	Television Receiver
TUBES	Eighteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 145 Watts, 1.2 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 1 or 6 and 10. Readjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart).

FUSES

A 7.5Ω fusible resistor (R89) is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

MAGNAVOX CHASSIS U74-01AA, U74-02AA, V74-01AA, V74-02AA

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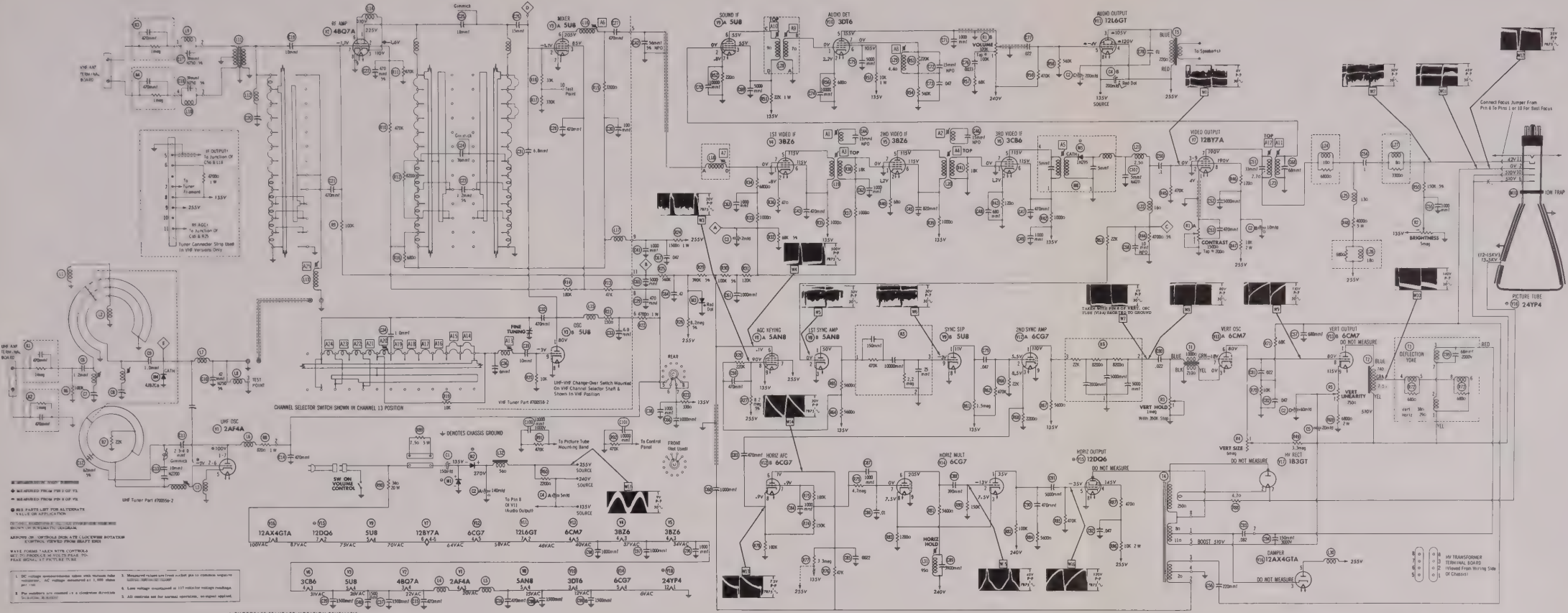
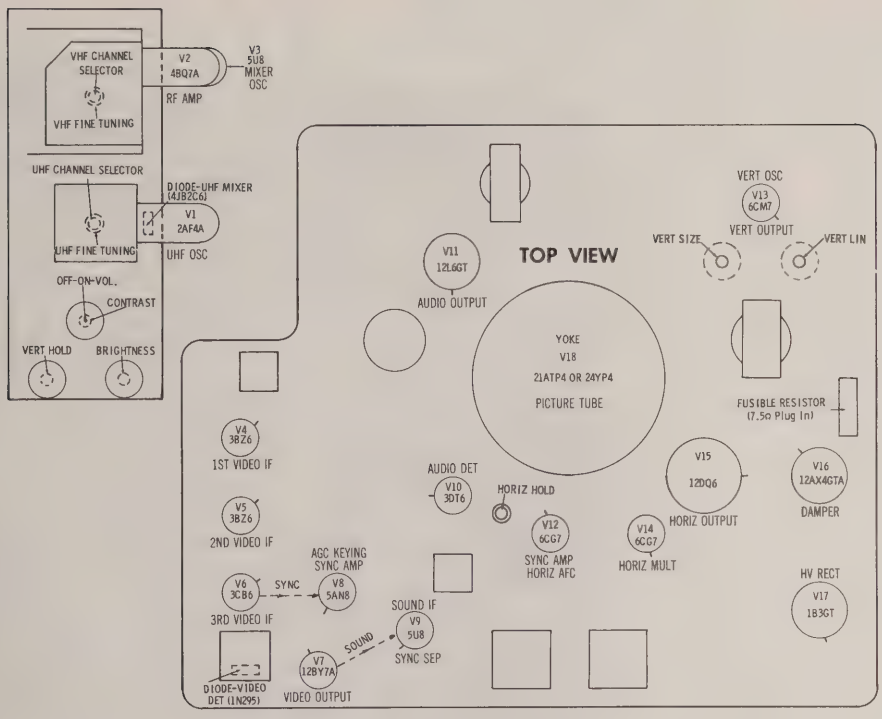


MAGNAVOX CHASSIS U74-01AA, U74-02AA, V74-01AA, V74-02AA

TUBE PLACEMENT CHART



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DENVER, COLORADO

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

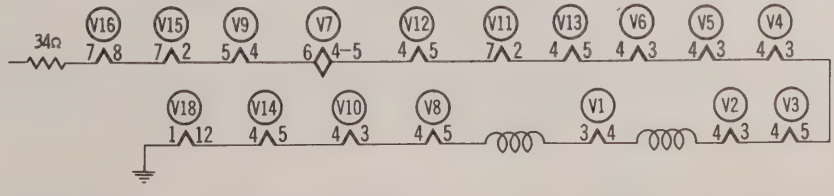
POWER SUPPLY FAILURE
No raster, no sound - Fusible Resistor (R89), Rectifiers (M1, M2)

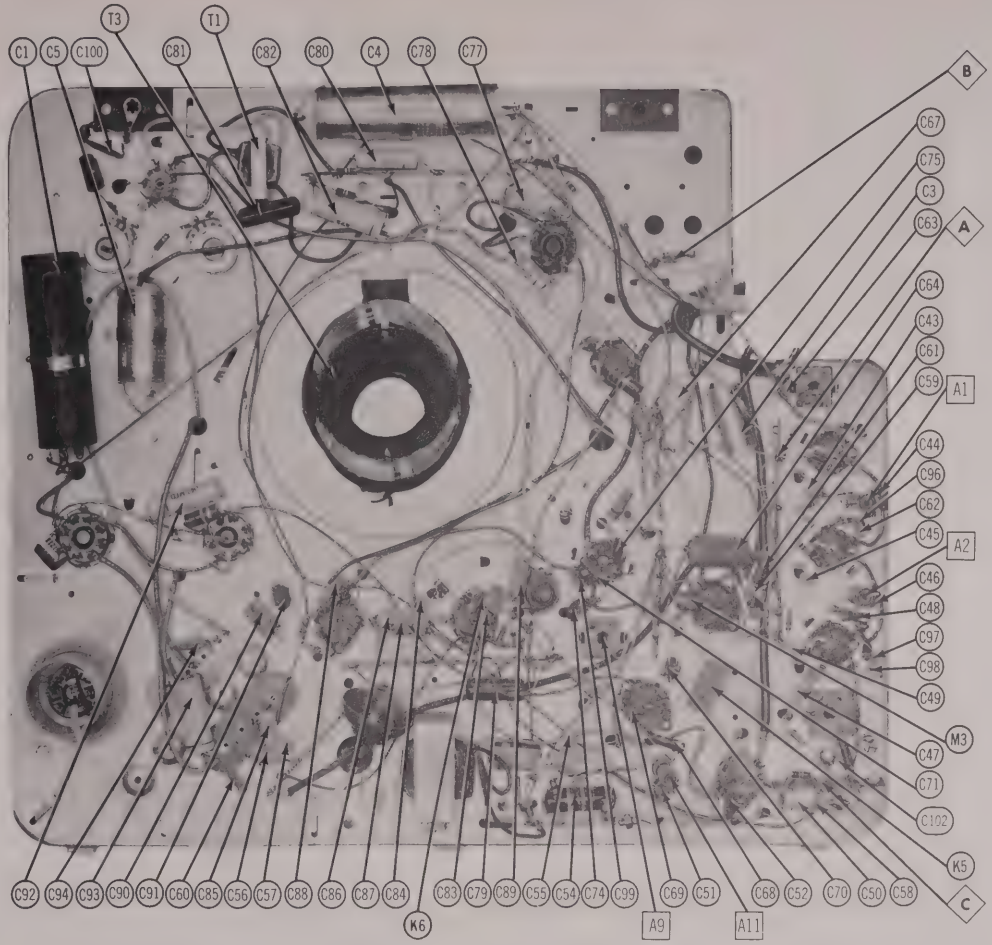
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V4, V5, V6, Diode (M5), V7, V11
No pic, no sound, has snow - V2, V3, V4 (V1 UHF only)
No pic, has sound, has raster - V7, V18
Has pic, no sound - V9, V10, V11
Overloaded picture - V8, Diode (M3), V11

SYNC FAILURE
No vert. sync - V8, V9, V12, V11
No horiz. sync - V8, V9, V12, V11
No vert. or horiz. sync - V8, V9, V12, V11

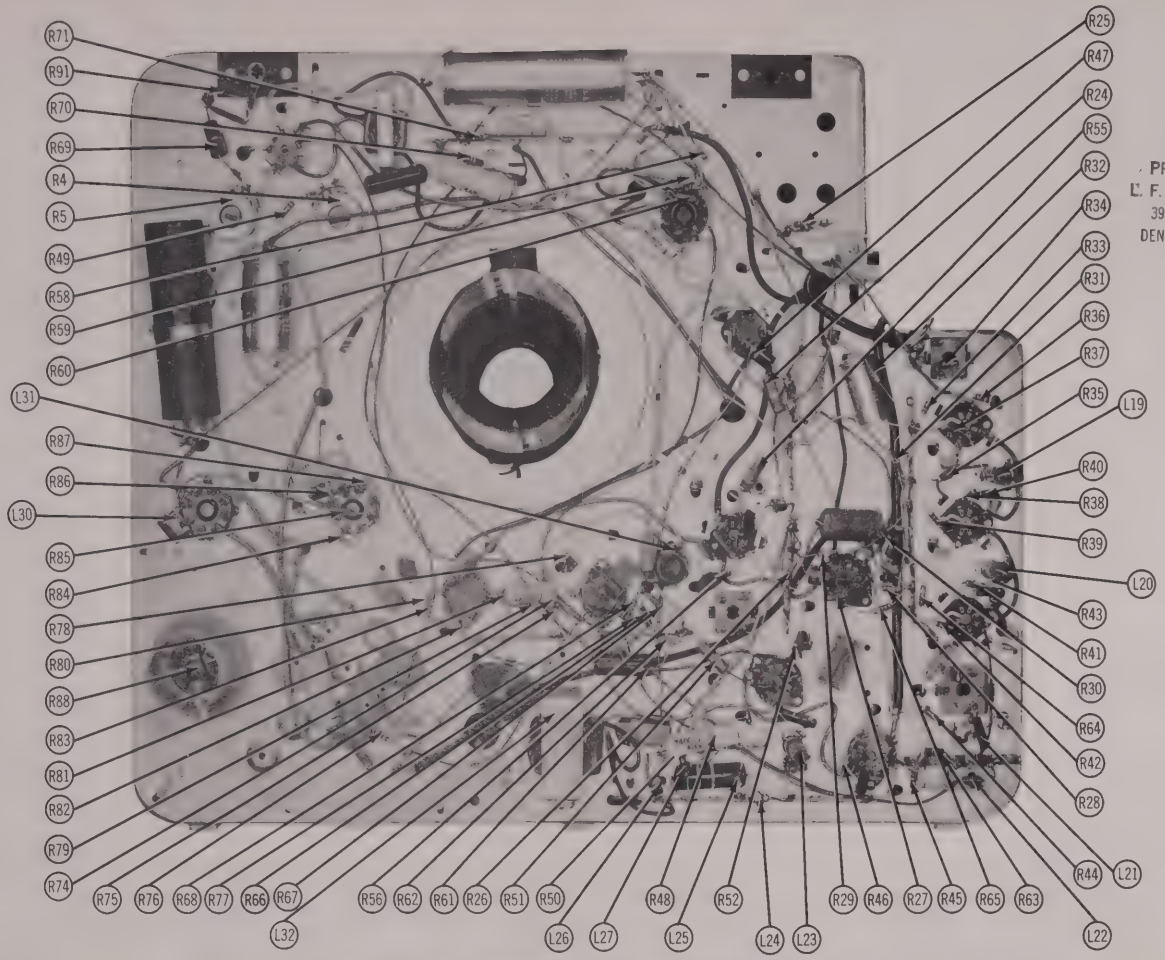
SWEEP FAILURE
No raster, has sound - V12, V14, V15, V16, V17, V18
No vertical deflection - V13
Poor vert. linearity or foldover - V13
Poor horiz. linearity or foldover - V14, V15, V16
Narrow picture - V14, V15, V16, M1, M2
Vert. off freq. - V13
Horiz. off freq. - V14

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.)





CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Turn contrast control fully counter clockwise.
Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
Connect the negative lead of a 1.5 volt bias supply to point Ⓑ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	50Ω Carbon Resistor	High side to pin 1 (grid) of 3BZ6 (V4). Low side to chassis.	43.0MC (10MC Swp)	47.25MC	Any non-interfering channel	Vert. Amp. thru 15K to point Ⓒ. Low side to chassis.	A1	Adjust to place marker in trap notch.
2.	"	"	"	41.25MC	"	"	A2	"
3.	"	"	"	42.75MC 45.25MC 45.75MC	"	"	A3, A4, A5	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Repeat steps 1 and 2.
4.	"	High side to point Ⓓ. Low side to chassis.	"	42.75MC 43.0MC 44.25MC 45.0MC 45.75MC	"	"	A6, A7	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown.

SOUND IF ALIGNMENT

1. Tune in a strong TV signal and adjust A8 for maximum sound and MINIMUM distortion.
2. Reduce the signal input by removing the antenna or connecting an adjustable attenuator between the antenna lead and the antenna terminals so that with the volume control set at maximum, the sound is barely audible. Adjust A9 for MINIMUM distortion and clearest sound.
3. With the same weak signal input, adjust A10 and A11 for MINIMUM distortion and clearest sound. Adjust A12 for MINIMUM 4.5MC beat in the picture.
4. Reduce the signal input further until hiss is heard in the sound and retouch A9 for MINIMUM noise and clearest sound.

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Fig. 3	Across VHF antenna terminals	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point Ⓒ. Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

UHF IF ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	1000Ω	High side to point Ⓔ. Low side to tuner chassis.	43.0MC (10MC Swp)	42.75MC 45.75MC	UHF	Vert. Amp. thru 15K to point Ⓒ. Low side to chassis.	A25	Adjust for maximum gain and MINIMUM tilt of response similar to Fig. 2.

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

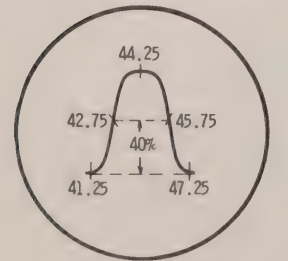


FIG. 1

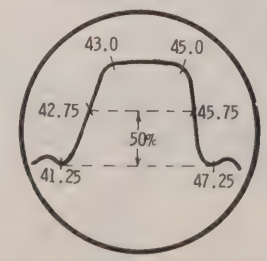


FIG. 2

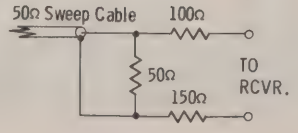


FIG. 3

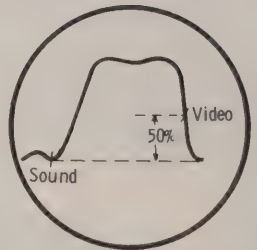


FIG. 4

CHASSIS TOP VIEW

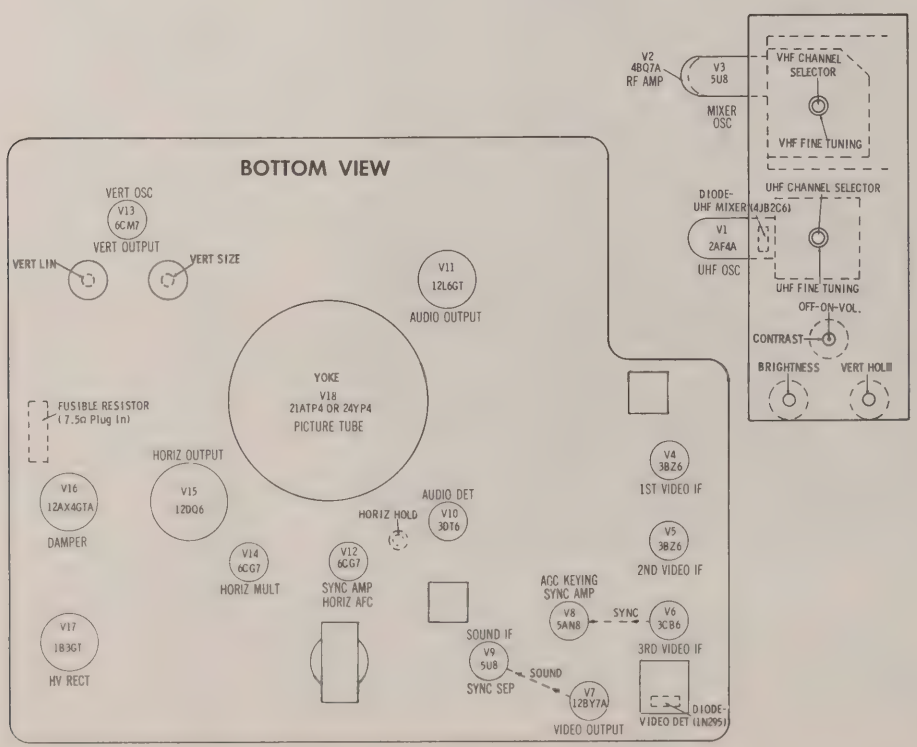
MAGNAVOX CHASSIS U74-01AA, U74-02AA,
V74-01AA, V74-02AA

FOLDER 3

RESISTANCE MEASUREMENTS

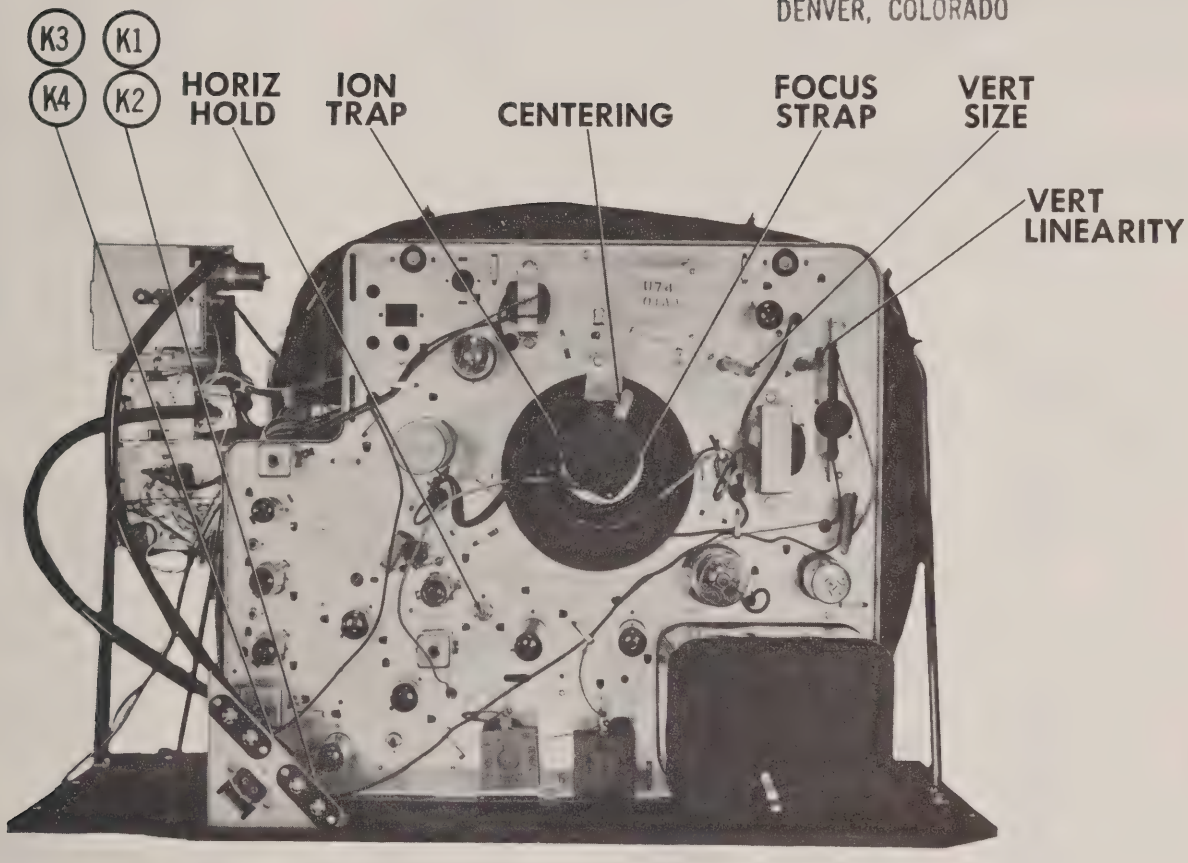
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2AF4A	■* 1200Ω	22K	5Ω	5.5Ω	1.1Ω	22K	■* 1200Ω		
V2	4BQ7A	† 1500Ω	230K	INF	5.5Ω	6.5Ω	INF	600K	0Ω	0Ω
V3	5U8	■ 5100Ω	360K	■ 47K	6.5Ω	7.5Ω	† 4800Ω	0Ω	0Ω	10K
V4	3BZ6	75K	47Ω	9Ω	10Ω	■ 1000Ω	■ 1000Ω	0Ω		
V5	3BZ6	69K	68Ω	8Ω	9Ω	■ 1000Ω	■ 1000Ω	0Ω		
V6	3CB6	.1Ω	120Ω	7.5Ω	8Ω	■ 1000Ω	■ 1000Ω	0Ω		
V7	12BY7A	• 200Ω	470K	0Ω	15Ω	15Ω	16Ω	† 4000Ω	† 18K	0Ω
V8	5AN8	■ 11K	27K	0Ω	4Ω	5Ω	160K	† 56Ω	■ 200K	■ 0Ω
V9	5U8	■ 1.5Meg	.8Ω	■ 22K	16Ω	17Ω	■ 22K	220Ω	0Ω	2.2Meg
V10	3DT6	7Ω	680Ω	4Ω	3Ω	■ 320K	■ 10K	560K		
V11	12L6GT	NC	11Ω	† 275Ω	† 56Ω	260K	TP	13Ω	¶	
V12	6CG7	■ 5600Ω	22K	2200Ω	15Ω	13Ω	40K	350K	100K	0Ω
V13	6CM7	‡750Ω	NC	210Ω	11Ω	10Ω	• ‡5Meg	• 550K	• † 5Meg	7500Ω
V14	6CG7	† 100K	150K	1200Ω	1.5Ω	3Ω	† 5900Ω	4.9Meg	1200Ω	0Ω
V15	12DQ6	TP	17Ω	TP	† 10K	470K	TP	21Ω	0Ω	TOP CAP ‡8Ω
V16	12AX4GTA	NC	NC	¶	NC	† 56Ω	TP	23Ω	21Ω	
V17	1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ‡258Ω
V18	24YP4	0Ω	78K	PIN 6 ‡11Ω	PIN 10 ‡11Ω	PIN 11 • 550K	PIN 12 1.5Ω			

* MEASURED IN "UHF" POSITION.
■ MEASURED FROM 135V SOURCE.
† MEASURED FROM OUTPUT OF M2.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
‡ MEASURED FROM PIN 3 OF V16.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE S:.
DENVER, COLORADO



CHASSIS—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.

2. Set the brightness and contrast controls for a normal picture.

3. Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

4. Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	UHF Osc.	2AF4A	
V2	RF Amplifier	4BQ7A	
V3	Mixer-Osc.	6U8	
V4	1st. Video IF Amp.	3DZ8	
V5	2nd. Video IF Amp.	3DZ8	
V6	3rd. Video IF Amp.	3CB6	
V7	Video Output	12BY7A	
V8	1st. Sync Amplifier	6AN8	
V9	Sound IF Amp.-Sync Sep.	5U8	

ITEM No.	USE	TYPE	NOTES
V10	Audio Det.	3DT6	
V11	Audio Output	12L6GT	
V12	2nd. Sync Amp.- Noris. AFC	6CG7	
V13	Vert Osc.-Vert Output	6CM7	
V14	Horiz. Mult.	6CG7	
V15	Horiz. Output	12DQ6	Note 1
V16	Damper	12AZ6/12A	
V17	HV Rectifier	1B3GT	

Note 1. Some versions may use a 12DQ6A.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA			NOTES
	MAGNAVOX PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V18	24TP4	24TP4	24TP4 ① 24DP4 ① 24DP4 21ATP4 21ATP4A③	① Aluminized Silver Screen "85"
	21ATP4	21ATP4A/21ATP4 ②		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	150	150	27955-1	AFHJ-24	XA025	FPU7	TMS-25	S-105	TVL-1429
C2A	40-60	300	27954-1	AFHS-4-47-50		FPS26 74		Q-182	R235i *
B	40-60	300				TC492		MTO-4540	
C	450	150							
D	60	150							
C3	2	50	27003T-53	PRS50V3	BSRS-50	TC303	TD-2-50	MT-0508	TVA-1301
C4A	5	150	27058-1	BR3-150	BC036	TC700	TDLD-16	D-088	TVA-2467
B	300	150				TCD2E25			
C5	30	500	27053-1	PRS500V20	BR3060	TC53	TD-30-500	S-315	TVA-1908

* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	1.2		25021I-115	MPG-81 1.0	TCZ-1		TCC-1.2		TCC-1	
C7			25018I-10							
C8			25018I-100							
C9	1.0		25022...-114	NPO-S2 1	TCZ-1		TCC-1		9TCCB-V1	
C10	47		25017S 21	N750-S1 47	TCT-47	C10Q47U	TCT-47	NT-5447	9TCU-Q47	N750 5%
C11	2.2-4		25022O-3		S2S-4		S1IS-E			
C12	.82		25022I-1001							5%
C13	10		25008I-160							N2200
C14	470		25017S-8	BPD-00047	DD-47I	BYA1QT47	ED-470	UC-5347	5GA-T47	
C15	470		25017S-8	BPD-00047	DD-47I	BYA1QT47	ED-470	UC-5347	5GA-T47	
C16	470		25017S-8	BPD-00047	DD-47I	BYA1QT47	ED-470	UC-5347	5GA-T47	
C17	39		25017S-20	N750-S1 39	TCN-39	C10Q39U	TCT-39			N750 5%
C18	39		25017S-20	N750-S1 39	TCN-39	C10Q39U	TCT-39			N750 5%
C19	10		25022...-127	NPO-S1 10	TCZ-10	LT6Q1	TCC-10	ZT-S31	9TCC-Q1	
C20			25018I-6							
C21	470		25017S-8	BPD-00047	DD-47I	BYA1QT47	ED-470	UC-5347	5GA-T47	
C22	470		25017S-8	BPD-00047	DD-47I	BYA1QT47	ED-470	UC-5347	5GA-T47	
C23	1.2		25022...-115	NPO-E1 1.2	TCZ-1				9TCCB-V1	5%
C24	56		25021E-5							
C25	15		25018I-14							
C26	15		25020T-5	NPO-S1 15	TCZ-15	LT6Q15	ED-15	UC-5415	9TCC-Q15	
C27	470		25017S-8	BPD-00047	DD-47I	BYA1QT47	ED-470	UC-5347	5GA-T47	
C28	470		25017S-8	BPD-00047	DD-47I	BYA1QT47	ED-470	UC-5347	5GA-T47	
C29	470		25017S-8	BPD-00047	DD-47I	BYA1QT47	ED-470	UC-5347	5GA-T47	
C30	100		25017S-24	BPD-00101	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C31	6.8		25021I-125	NPO-S1 6.8	TCZ-6R8	C10Y6BC	TCC-6.8	ZT-5S68	9TCCB-V68	
C32	470		25021E-15	BPD-00047	DD-47I	BYA1QT47	ED-470	UC-5347	5GA-T47	
C33	470		25017S-8	BPD-00047	DD-47I	BYA1QT47	ED-470	UC-5347	5GA-T47	
C34	1.0		25008I-144	NPO-E1 1.0	TCZ-1		TCC-1		9TCC-Q1	
C35	10		25008I-139	NPO-E1 10	TCZ-10	LT6Q1	TCC-10	ZT-S41	9TCC-Q1	
C36	6		25008I-1							
C37	1500		25017S-10	BPD-00115	DD-152	BYA10Q15	ED-0015	DC5215	5HK-D15	
C38	1000		25017S-14	BPD-001	DD-102	BYA1QZ	ED-1000	DC521	5HK-D1	
C39	1500		25017S-10	BPD-00115	DD-152	BYA10Q15	ED-0015	DC5215	5HK-D15	
C40	1500		25017S-10	BPD-00115	DD-152	BYA10Q15	ED-0015	DC5215	5HK-D15	
C41	1000		25017S-22	BPD-001	DD-102	BYA1QZ	ED-1000	DC521	5HK-D1	
C42	56		25017S-50	N750-S1 56	TCZ-56	C10Q56C	TCC-56			N750 5%
C43	470		25020T-50	S1 470	D6-47I	LT6T47	ED-470	UC-5347	5GA-T47	
C44	15		25008I-146	NPO-S2 15	TCZ-15	C10Q15C	TCC-15		9TCC-Q15	NP0
C45	820		25017S-38		D8-82I	L40T82	ED-820		5GA-T82	
C46	15		25008I-143	NPO-S1 15	TCZ-15	C10Q15C	TCC-15		9TCC-Q15	NP0
C47	470		25015S-1090	1464-00047		LR5T47	ED-470	UC-5347	5GA-T47	
C48	680		25020T-51	S1 680	D8-68I	LT6T68	ED-680	UC-5368	5GA-T68	
C49	1000		25017S-14	BPD-001	DD-102	BYA1QZ	ED-1000	DC521	5HK-D1	
C50	1	200	25020J-13	P288N-1		DF-104	CUB2P1		GEM-2101	2TM-P1
C51	15		25008I-148	S1 33		D6-33I	LT6Q33	ED-33	5CA-Q33	
C52	5000		25017S-1	BPD-005	DD-503	BYA10D5	ED-005	DC525	5HK-D5	
C53	470		25020T-50	S1 470	D6-47I	LT6T47	ED-470	UC-5347	5GA-T47	
C54	1	400	25020T-1	P488M-1		DF-104	CUB4P1		GEM-4101	4TM-P1
C55	1000		25017S-14	BPD-001	DD-102	BYA1QZ	ED-1000	DC521	5HK-D1	
C56	220		25017S-30	BPD-00021	DD-221	BYA1QZ	ED-220	UC-5322	5GA-T22	
C57	680		25017S-38	BPD-00068	DD-681	BYA10T6S	ED-680	UC-5368	5GA-T68	
C58	10		25008I-165	NPO-S1 10	TCZ-10	C10Q1C	TCC-10	ZT-S41	9TCC-Q1	NP0
C59	470		25020T-50	S1 470	D6-47I	LT6T47	ED-470	UC-5347	5GA-T47	
C60	1000		25020T-51	S1 1000	D6-102	BYA1QZ	ED-1000	DC521	5HK-D1	
C61	1000		25020T-51	S1 1000	D6-102	BYA1QZ	ED-1000	DC521	5HK-D1	
C62	1000		25017S-14	BPD-001	DD-102	BYA1QZ	ED-1000	DC521	5HK-D1	
C63	1000		25017S-14	BPD-001	DD-103	BYA1QZ	ED-1000	DC521	5HK-D1	
C64	47	100	25017Q-1	P288N-47		CUB2P47		GEM-3047	2TM-P47	
C65	5000		25017S-1	BPD-005	DD-503	BYA10D5	ED-005	DC525	5HK-D5	
C66	1000		25017S-14	BPD-001	DD-102	BYA1QZ	ED-1000	DC521	5HK-D1	
C67	047	400	25021I-47	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C68	68		25008I-147	S1 68	D6-68I	LT6Q68	ED-68	SA-Q68	5CA-Q68	
C69	5000		25017S-2	BPD-005	DD-503	BYA10D5	ED-005	DC525	5HK-D5	
C70	10000		25017S-15	BPD-010	DD-103	BYA1QZ	ED-01	DC531	5HK-01	
C71	1000		25020T-52	S1 1000	D6-102	BYA1QZ	ED-1000	DC521	5HK-D1	
C72	15		25008I-149	NPO-S2 15	TCZ-15	C10Q15C	TCC-15		9TCC-Q15	NP0
C73	047	200	25020J-11	BPD-05	DF-503	CUB2S47		GEM-2147	2TM-S47	

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C74	10000		25017S-2	BPD-01	DD-103	BYA6S1	ED-01	DC531	5HK-01	
C75	5000		25017S-1	BPD-005	DD-503	BYA10D5	ED-005	DC525	5HK-D5	
C76	.0033	400	25021I-4	BPD-0033	D6-332	CUB4D33	ED-0033	GEM-4233	4TM-D33	
C77	.022	400	25021I-2	BPD-05	DF-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C78	01	400	25021I-7	BPD-01	DD-103	CUB4S1	ED-01	GEM-411	4TM-S1	
C79	.047	400	25021I-11	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C80	.022	400	25021I-9	BPD-02	DF-203	CUB4D22	ED-02	GEM-4122	4TM-D22	
C81	.022	200	25021I-9	BPD-02	DF-203	CUB4S22	ED-02	GEM-2122	4TM-S22	
C82	.047	400	25021I-11	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C83	470		25020T-50	S1 470	D6-47I	BYA10T47	ED-470	UC-5347	5GA-T47	
C84	1000		25017S-14	BPD-001	DD-102	BYA6S1	ED-1000	DC521	5HK-D1	
C85	.0022	400	25021I-3	BPD-0022	D6-222	CUB4D22	ED-0022	GEM-4222	4TM-D22	
C86	01	400	25021I-7	BPD-01	DD-103	CUB4S1	ED-01	GEM-411	4TM-S1	
C87	1000		25017S-14	BPD-001	DD-102	BYA6S1	ED-1000	DC521	5HK-D1	
C88	390		25015S-1089	1464-00039		LR5T39		SR5D39	MS-339	
C89	3900		25015S-1092	1464-00038		LR5T39		SR5D39	MS-239	
C90	470		25015S-1090	1464-00047		LR5T47			MS-347	
C91	5000		25017S-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C92	.047	400	25021I-11	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C93	.082	200	25021J-17	P288H-08		CUB2S82		GEM-2182	2TM-S8	
C94	150	3000	25017S-43	HVD-30-150	DD30-151	HVA30Q15			3DG-Q-T15	
C95	68	2000	25017S-23	HVD-20-68	DD20-680	HVA30Q68		DC30468		
C96	1000		25017S-14	BPD-001	DD-102		ED-1000	DC521	5HK-D1	
C97	1000		25017S-14	BPD-001	DD-103		ED-1000	DC521	5HK-D1	
C98	1000		25017S-14	BPD-001	DD-102		ED-1000	DC521	5HK-D1	
C99A	1500		25018I-5	BPD-30D015	DD2-152	BYC5DD15	ED2-0015	DC5D5215	5HK-3D15	
B	1500									
C100	10000	1000	25021S-2							
C101	10000		25017S-2	BPD-01	DD-103	BYA6S1	ED-01	DC531	5HK-01	
C102	5									N470

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	3306S22					Contrast Tap @ 300Ω
B	330Ω	½						Volume Tap @ 100Ω
C	Switch							Attach to R1B
R2A	5Meg	½	3306S6-1	B-5T	A47-5Meg-S	QU-141	TA5SR	Brightness
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	Attach to R2A
R3A	1Meg	½	3306S3-1	B-1T ★	A47-500K-T4	QU-138 *	TA5SL ▲	Vert hold with 350K stop
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	Attach to R3A
R4A	5Meg		3306S5-2					Vert size
B	Shaft							Attach to R4A
R5A	750Ω		3306S6-2				PTA75L	Vert Lin.
B	Shaft							Attach to R5A

▲ Use a 470K resistor in series with the right hand terminal.
* Use a 330K resistor in series with the right hand terminal.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MAGNAVOX PART No.	IRC PART No.	NOTES
R6	100K		23010M-86	BTS-100K	
R7	22K		23010M-78	BTS-22K	
R8	820Ω	1	23014S-61	BTA-820	
R9	100K		23010M-86	BTS-100K	
R10	470K		23010M-94	BTS-470K	
R11	470K		23010M-94	BTS-470K	
R12	820Ω		23010M-73	BTS-8200	
R13	47K		23010M-82	BTS-47K	
R14	180K		23010M-89	BTS-180K	
R15	3300Ω		23010M-68	BTS-3300	
R16	680Ω		23010M-69	BTS-680	
R17	330K		23010M-92	BTS-330K	
R18	33K		23010M-80	BTS-33K	
R19	10K		23010M-74	BTS-10K	
R20	10K		23010M-74	BTS-10K	
R21	150Ω		23010M-53	BTS-150	
R22	4700Ω	1	23005S-175	BTA-4700	
R23	330Ω		23010M-53	BTS-330	
R24	1500Ω	1	23010S-84	BTA-1500	
R25	390K		23010M-91	BTS-390K	
R26	9.2Meg		23009M-353	BTS-8.2Meg	
				5%	
R27	8.2Meg		23009M-353	BTS-8.2Meg	
	5%			5%	
R28	330K		23010M-92	BTS-330K	
R29	390K	5%	23009M-321	BTS-390K 5%	
R30	470K	5%	23009M-327		
R31	130K		23010M-87		
R33	68K	5%	23009M-303	BTS-68K 5%	
R34	10000Ω		23009M-13	BTS-1000	
R35	6800Ω		23009M-72	BTS-6800	
R36	10000Ω		23009M-13	BTS-1000	
R37	470Ω		23010M-46	BTS-47	
R38	1000Ω		23010M-53		
R39	18K		23010M-77	BTS-18K	
R40	1000Ω		23009M-13	BTS-1000	
R41	18K		23010M-77	BTS-18K	
R42	1000Ω		23010M-53	BTS-1000	
R43	130Ω		23010M-51	BTS-130	
R44	4700Ω	5%	23009M-175	BTS-4700 5%	
R45	470K		23010M-94	BTS-470K	
R46	120Ω		23010M-51	BTS-120	
R47	18K	2	23010M-77	BTS-18K	
R48	4000Ω	5	240071-19	PWT-4000	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MAGNAVOX PART No.	IRC PART No.	NOTES
R49	3.3Meg		23008M-34	BTS-3.3Meg	
R50	150K	5%		BTS-150K 5%	
R51	22K	1	23010S-76	BTA-22K	
R52	2200Ω		23010M-64	BTS-2200	
R53	220K		23010M-90	BTS-220K	
R54	560K		23010M-93	BTS-560K	
R55	10K	1	23010S-74	BTA-10K	
R56	680Ω		23010M-69	BTS-680	
R57	68K		23010M-84	BTS-68K	
R58	560K			BTS-560K	
R59	470K		23010M-94	BTS-470K	
R60	2200Ω		23010M-64	BTS-2200	
R61	1.5Meg		23009M-329	BTS-1.5Meg	
R62	470K		23010M-94	BTS-470K	
R63	22K		23010M-78	BTS-22K	
R64	5600Ω		23010M-71	BTS-5600	
R65	5600Ω		23010M-71	BTS-5600	
R66	22K		23010M-78	BTS-22K	
R67	5600Ω		23010M-71	BTS-5600	
R68	2200Ω		23010M-64	BTS-2200	
R69	6800Ω	2	23010S-72	BTS-6800	
R70	10K		23010M-74	BTS-10K	
R71	68K		23010M-84	BTS-68K	
R72	680Ω		23010M-60		
R73	680Ω		23010M-69		
R74	180K		23010M-89	BTS-180K	
R75	100K		23010M-86	BTS-100K	
R76	47K		23010M-82	BTS-47K	
R77	3.3Meg		23009M-34	BTS-3.3Meg	
R78	100K		23010M-86	BTS-100K	
R79	4.7Meg		23009M-35	BTS-4.7Meg	
R80	150K		23010M-88	BTS-150K	
R81	5600Ω		23010M-71	BTS-5600	
R82	100K		23010M-86	BTS-100K	
R83	1200Ω		23010M-63	BTS-1200	
R84	5600Ω		23010M-71	BTS-5600	
R85	470K		23010M-94	BTS-470K	
R86	10K	2	23010S-76	BTA-10K	
R87	470Ω		23010M-59	BTS-470	
R88	4.7Ω		23010S-3	BWA-4.7	
R89	7.5Ω	5	240801-1	PWT-7.5	
R90	34Ω	20	240071-20		
R91	470K		23010M-94	BTS-470K	
R92	470K		23010M-94	BTS-470K	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA MAGNAVOX PART No.	Hallorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Vert Osc.	320801-4	B6704	A-3006	209T1 ①	Y406	A-8125	28A05
T2	Vert Output	320810-1	Z1804	A-3037	222T1	V313	A-8122	28S52
T3A	Yoke-Horiz.(21MH)	320322-1	DF607 ②	MDY-12 ②	235D1 ②	Y90F18/43 ③	DY-16A ②	Y-18 ②
B	(90°)-Vert (44MH)							
M8	Yoke Rear Cover & Centering Device	313323-1						
T4	Horiz. Output	320811-1						

① Drill new mounting holeing.
② Use original rear cover and centering device, and original yoke damping network if necessary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA MAGNAVOX PART No.	Hallorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	3500Ω	3-4Ω	320802-2	Z1111	A-2928	A-3076	22S45	S-1X	

COILS (RF-IF)

ITEM No.	USE	MAGNAVOX PART No.	NOTES
L1	RF Choke	380574-30	
L2	RF Choke	380574-30	
L3	Cathode Choke	380532-7	
L4	Fil. Choke	380574-6	
L6	Fil. Choke	380574-6	
L7	RF Choke	380574-6	
	UHF IF		
L7	Output Coil	380574-13	
L8	RF Choke	380574-30	
L9	IF Trap	380415-38	

ITEM No.	USE	MAGNAVOX PART No.	NOTES
L10	IF Trap	380415-36	
L11	Ant. Trans.	380491-3	
L13	RF Choke	380601-8	4.7 Microhenries, IRC Part #CLA
L15	UHF IF		
	Input Coil	380569-1	
L16	Neutr. Coil	380515-68	
L18	RF Choke	380601-9	1.0 Microhenry
L18	Mixer Plate Coil	380540-1	
L17	RF Choke	380601-1	.47 Microhenry, IRC Part #CLA

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI	DC RES. SEC	REPLACEMENT DATA MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L31			361309-1	19-1676 *	TV-185 *	6215 *			HS-7 *	

* Drill new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT (000 ℄)	MAGNAVOX PART No.	Hallorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L33	.330A	50Ω	1 Hy.	330803-3	CS037 ①	C-2996 ①	C-3327	20C44 ①	C-34X

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	MAGNAVOX PART No.	REPLACEMENT DATA
K1	Antenna Input	470MMF, 1Meg	2307S1-1 Centralab DA832
K2	Antenna Input	470MMF, 1Meg	2307S1-1 Centralab DA832
K3	Antenna Input	470MMF, 1Meg	2307S1-1 Centralab DA832
K4	Antenna Input	470MMF, 1Meg	2307S1-1 Centralab DA832
K5	Sync Complete	150MMF, 10000MMF, 25MMF, 470K, 2.2Meg	2307S6-1
K6	Vertical Integrator	3300MMF, 5000MMF, 5000MMF, 820Ω, 820Ω, 22K	2307S6-2 Aerovox PA-50 Centralab 501-104 Erie 1405-01 Sprague 103C12

MAGNAVOX CHASSIS U74-01AA, U74-02AA, V74-01AA, V74-02AA

FIGURE 3

PARTS LIST AND DESCRIPTIONS (Continued)

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT (Measured)	MAGNAVOX PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.230A	57E16-C ①②	1090A ②	1N1007 ③	RS300SL ②	6S300 ②	300 ②	
M2	.230A	57E16-C ①②	1090A ②	1N1007 ③	RS300SL ②	6S300 ②	300 ②	
M3		530554-1 ②	1215 ②		1T1 ②			

① Alternate Part #530551-6
② Selenium Type
③ Germanium Type

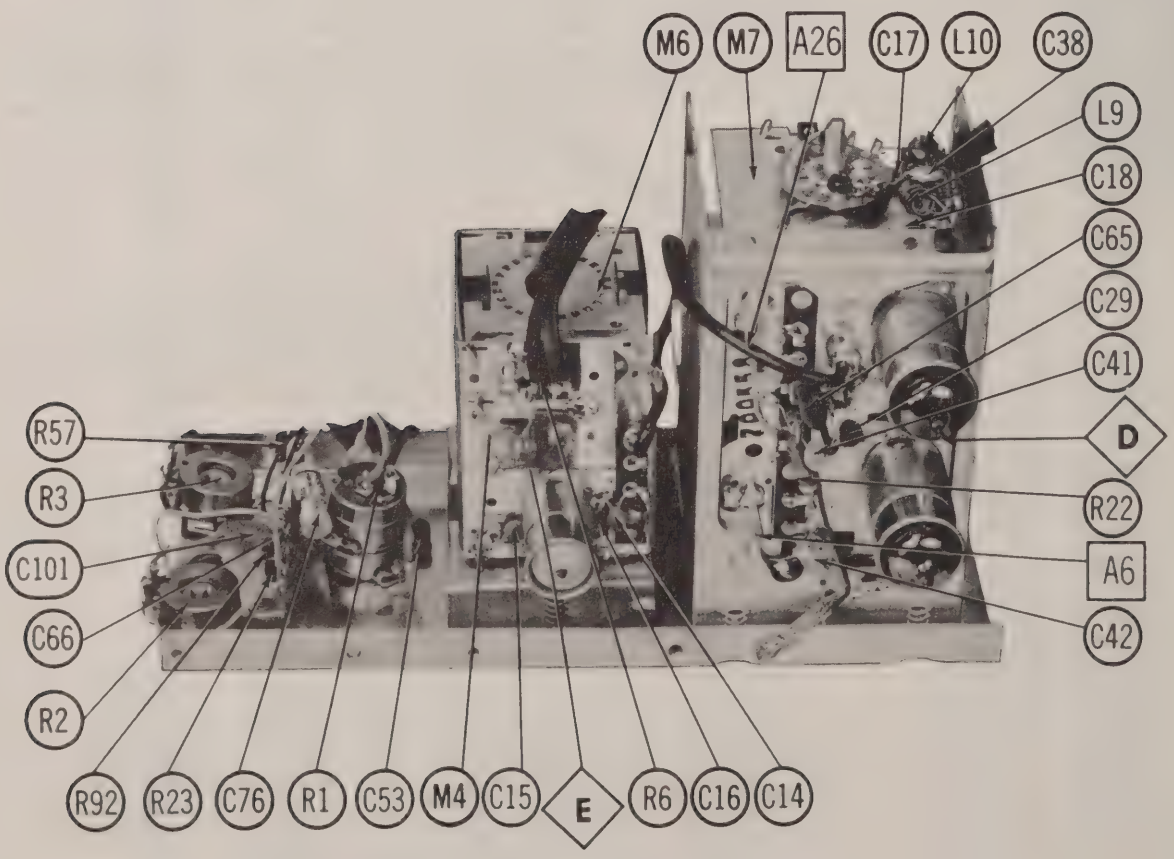
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MAGNAVOX PART No.	CBS PART No.	SYLVANIA PART No.	
M4	4JB2C6	530036-1	1N82A	1N82A	UHF Mixer (Clip in)
M5	1N295 *		1N60	1N60	Video Det. (Pigtail)

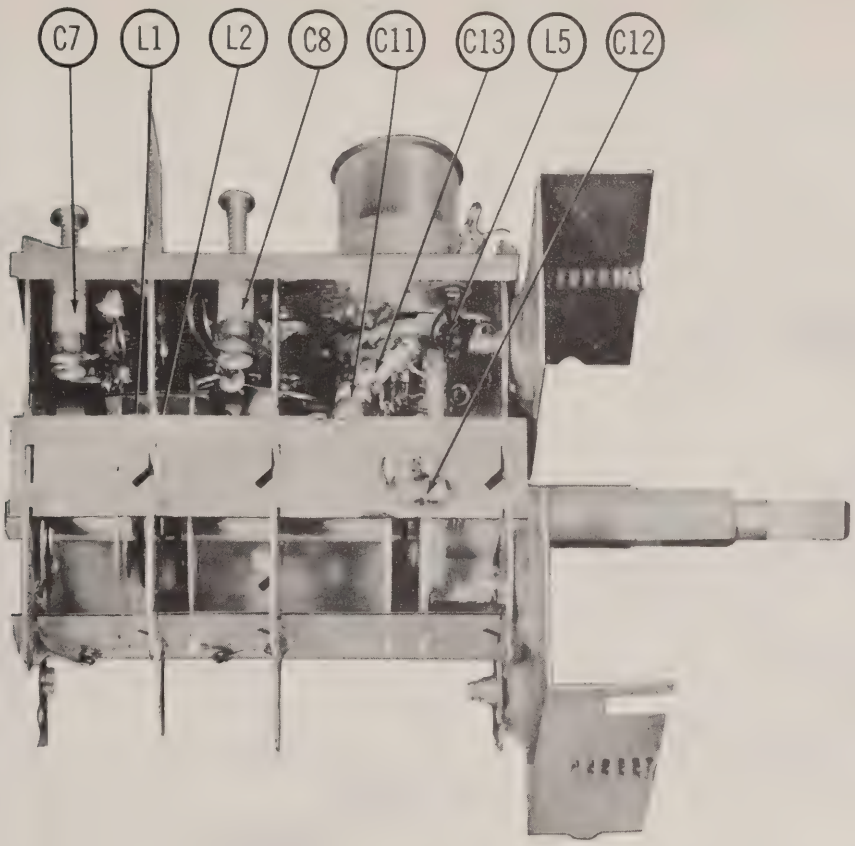
* A 1N64 may be used in some versions.

MISCELLANEOUS

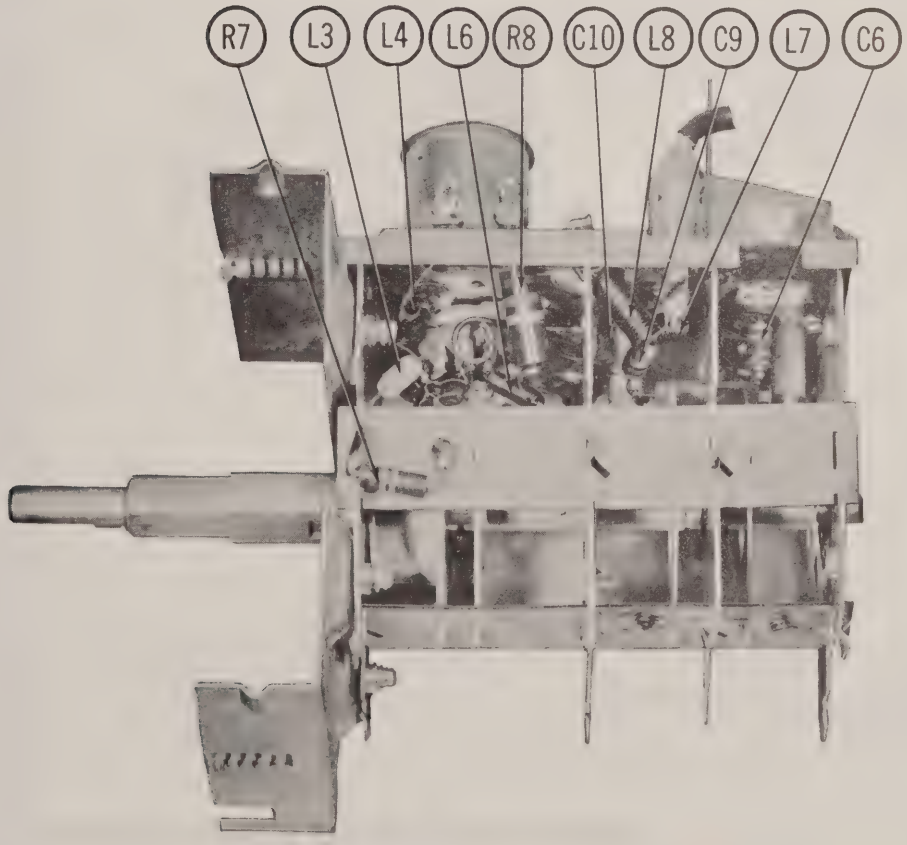
ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M6	Tuner	700556-2	UHF
M7	Tuner	700558-2	VHF
M8	Crystal Det. Ass'y.	361204-1	Includes 4th. Video IF, Caps, Peaking Coil & M5
M9	Centering Device	361223-1	Includes Yoke Rear Cover
M10	Ion Trap	360492-9	



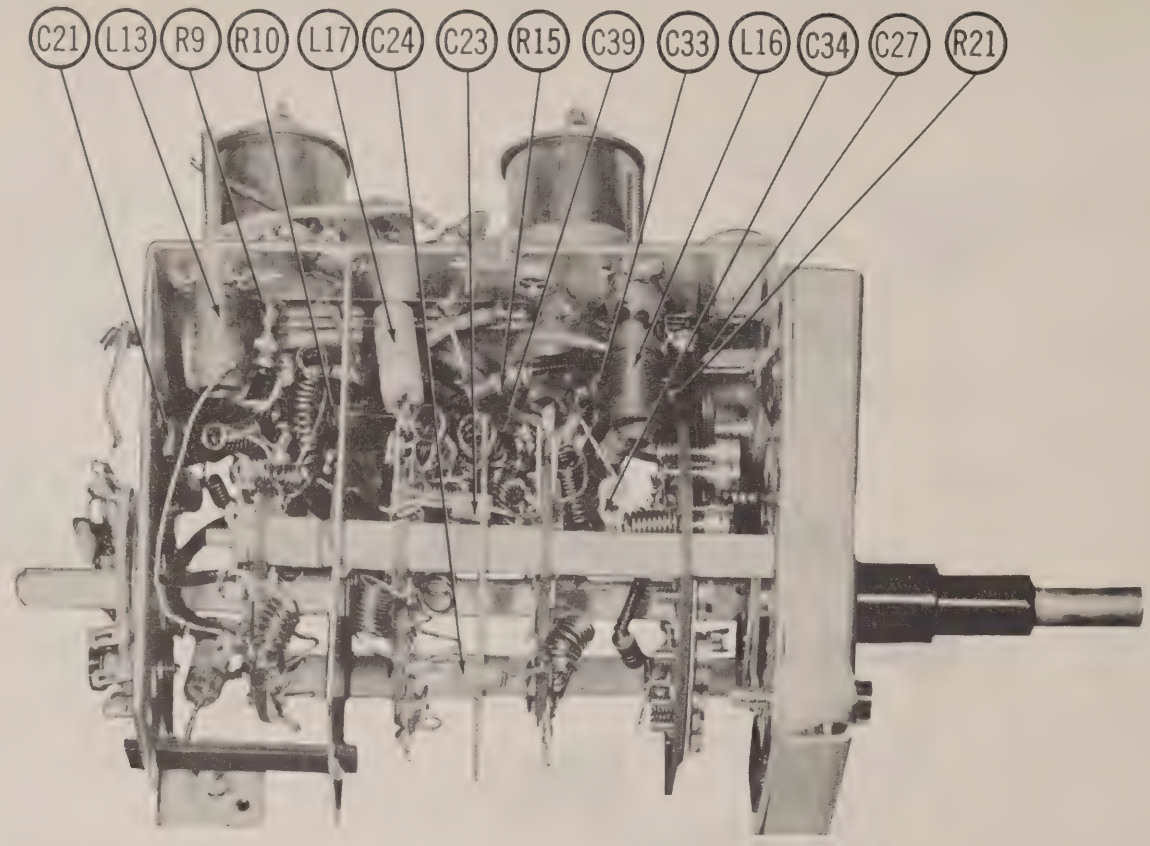
RF TUNER TOP VIEW



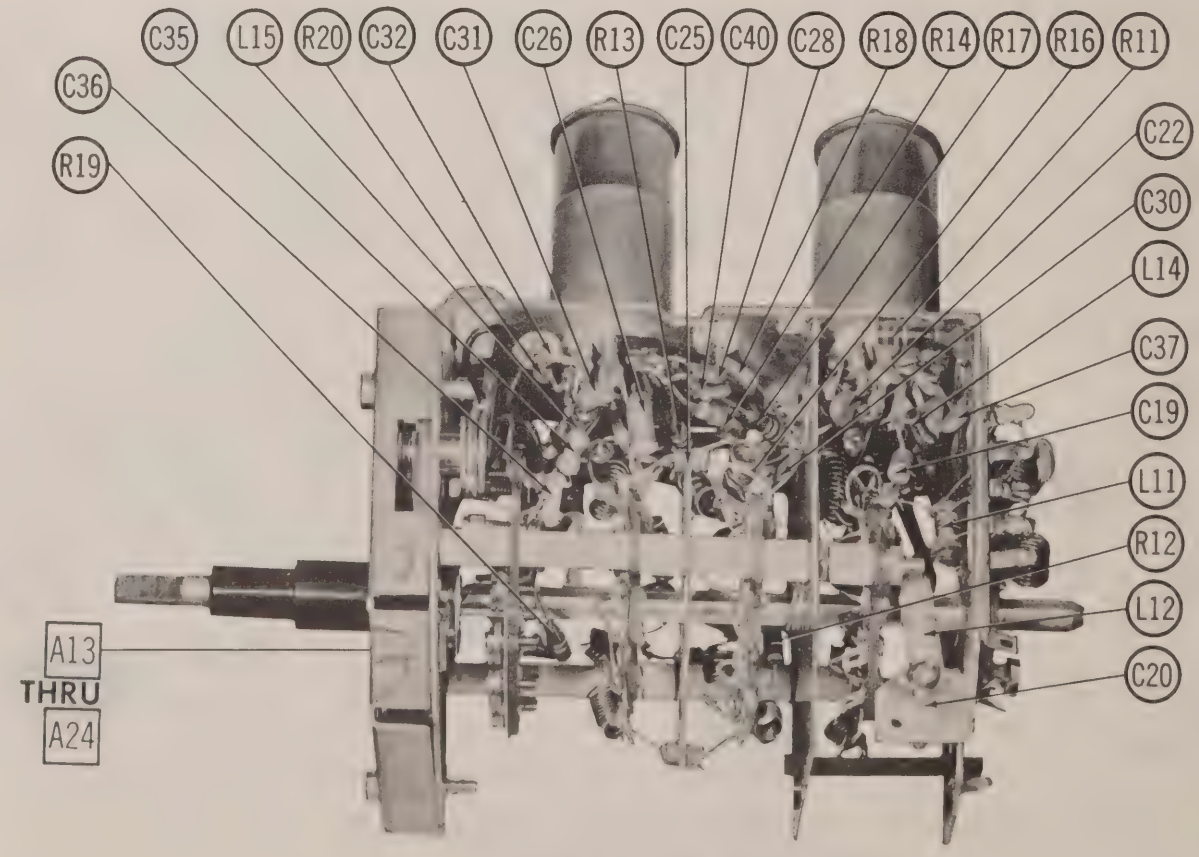
UHF TUNER-LEFT SIDE



UHF TUNER-RIGHT SIDE



VHF TUNER-LEFT SIDE



VHF TUNER-RIGHT SIDE

PHOTOFACT* Folder

*TRADE MARK

RCA VICTOR MODELS 17-S7090, U, 17-S-7092, U, 17-S-7093, U, 17-S-7099, U (Ch. 5377, 5378)

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L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

MODEL 17-S-7090 (Ch. 5377)

RCA VICTOR MODELS 17-S7090, U, 17-S-7092, U, 17-S-7093, U, 17-S-7099, U (Ch. 5377, 5378)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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RCA VICTOR MODELS 17-S7090, U, 17-S-7092, U, 17-S-7093, U, 17-S-7099, U (Ch. 5377, 5378)

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3924 MEADE ST.
DENVER

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 metal screws and the rear cover.

2. Pull up on the brightness, contrast and volume knobs to disengage them from the control shafts. These knobs are secured in the cabinet by retaining clips and do not remove completely. Turn the channel selector to channel 7 and the fine tuning knob until the slot in the knob (inside the cabinet) is facing the rear of the receiver. Using a small shank screwdriver release the locking clamp on the channel selector knob and pull knob up to remove. Remove the fine tuning knob.

3. Remove 2 metal screws and the speaker.

4. Remove the picture tube socket, ion trap, yoke clamp and HV lead.

5. Remove 2 screws from the rear of the cabinet holding rear chassis feet.

6. Lift chassis and pull out to remove.

MODEL 17-S-7090 (Ch. 5377)

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

TRADE NAME	RCA Victor	MODELS	CHASSIS
		17-S-7090, 17-S-7092, 17-S-7093, 17-S-7099	5377
		17-S-7090U, 17-S-7092U, 17-S-7093U, 17-S-7099U	5378
MANUFACTURER	Radio Corporation of America, RCA Victor Television Div., Camden 8, N.J.		
TYPE SET	Television Receiver		
TUBES	Sixteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 165 Watts, 1.5 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of the VHF oscillator it is necessary to remove the chassis from the cabinet. (See disassembly instructions).

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube and safety glass cleaning, it is necessary to remove the chassis. (See disassembly instructions).

FOCUS

Adjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A10) located on top of chassis.

FUSES

A 4.7Ω fusible resistor (R84) is used for LV power supply protection . (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

ANTI-PIN CUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible; position the 2 magnets so that all sides are straight.

RCA VICTOR MODELS 17-S7090, U, 17-S-7092, U, 17-S-7093, U, 17-S-7099, U (Ch. 5377, 5378)

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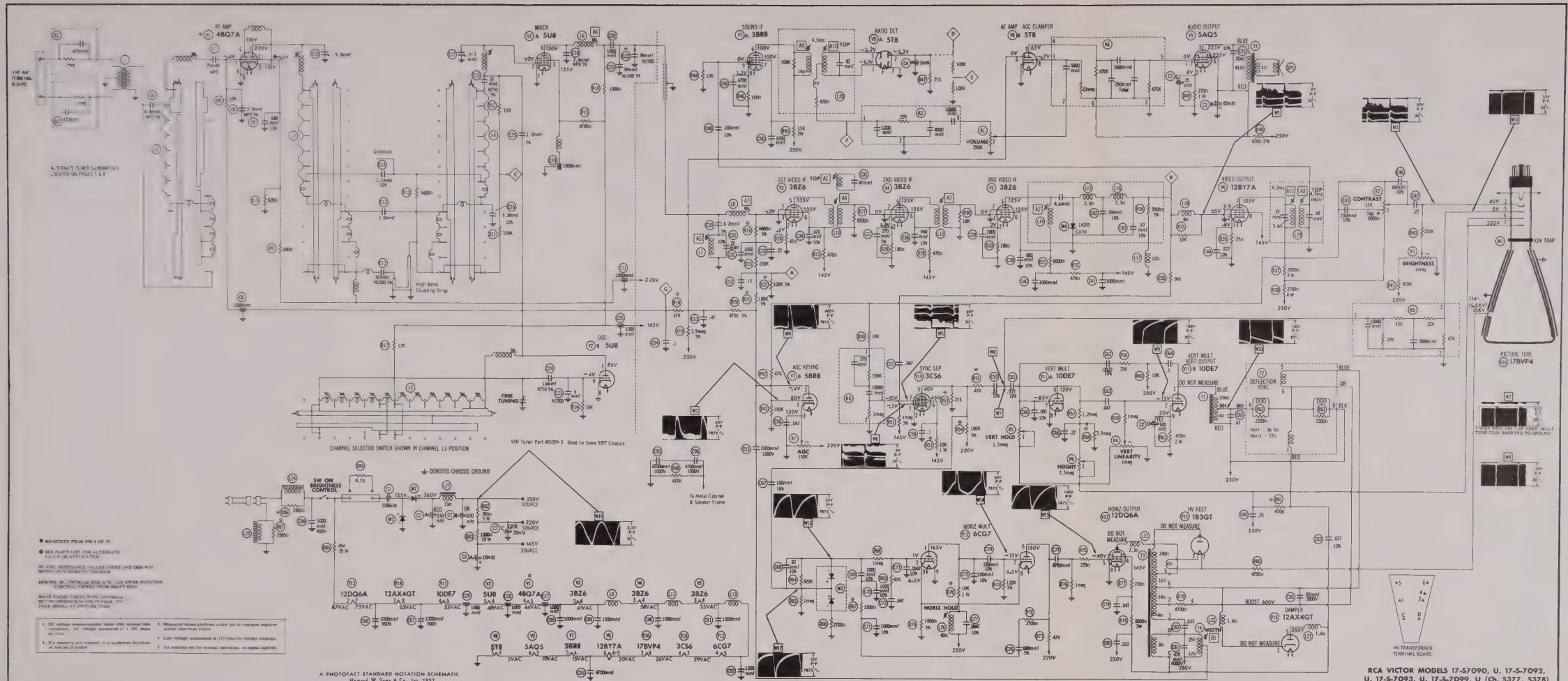
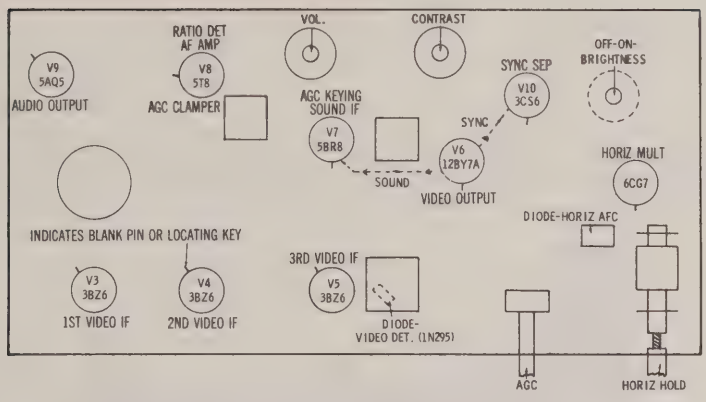


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

RCA VICTOR MODELS 17-S7090, U, 17-S-7092, U, 17-S-7093, U, 17-S-7099, U (Ch. 5377, 5378)

TUBE PLACEMENT CHART



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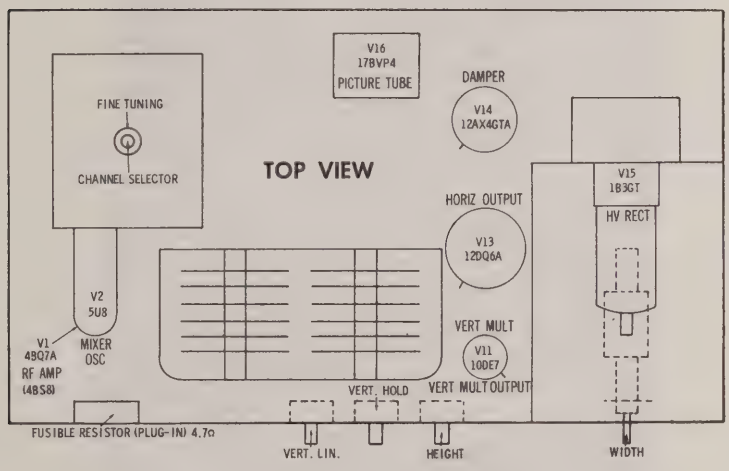


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

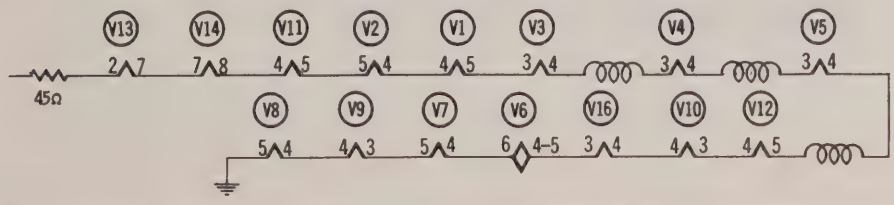
POWER SUPPLY FAILURE
No raster, no sound - Fusible Resistor (R84), Rectifier (M1, M2)

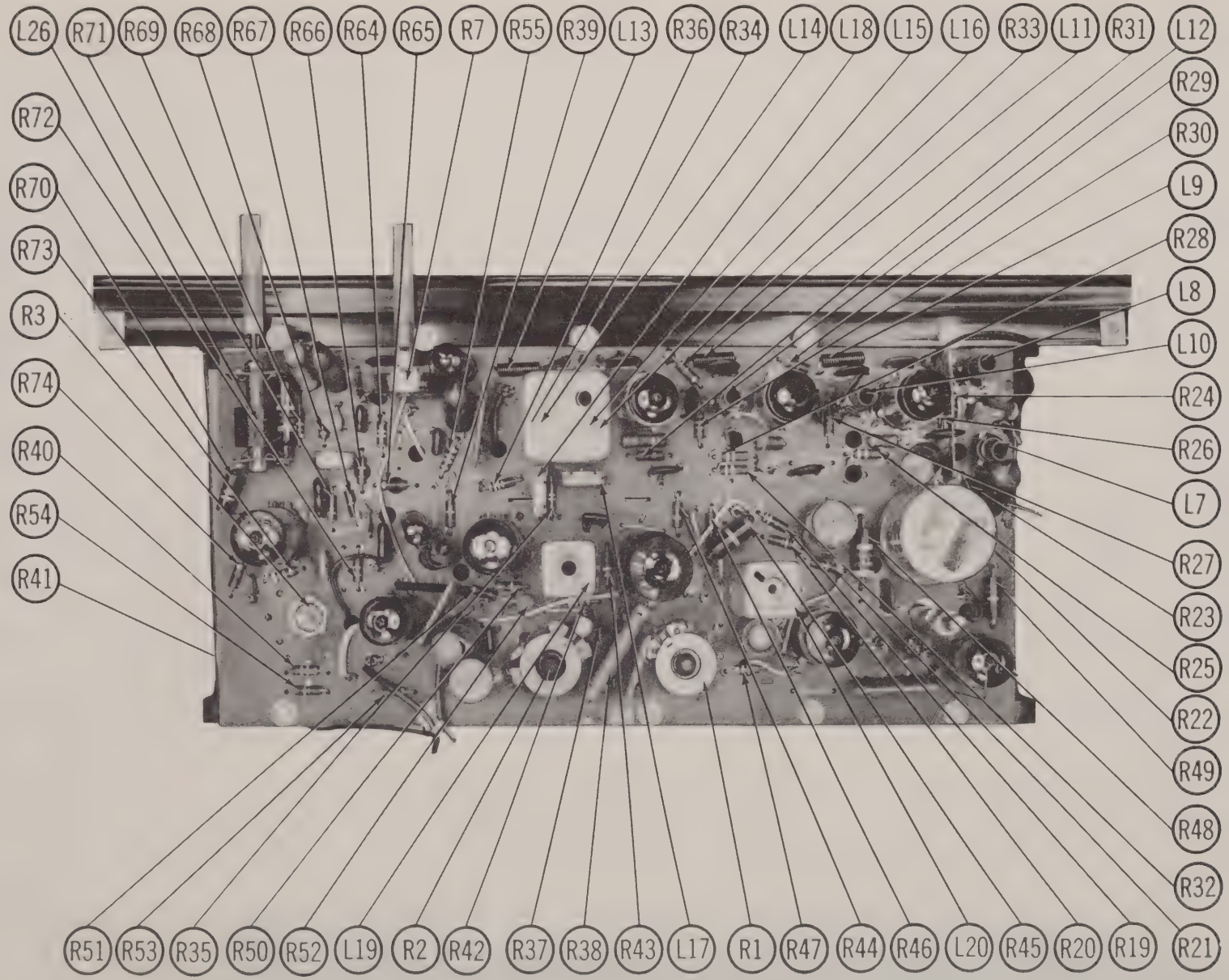
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, Diode (M4), V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V16
Has pic, no sound - V7, V8, V9
Overloaded picture - V7, V8

SYNC FAILURE
No vert. sync - V10
No horiz. sync - V10, Diode (M3)
No vert. or horiz. sync - V10

SWEEP FAILURE
No raster, has sound - M3, V12, V13, V14, V15, V16
No vertical deflection - V11
Poor vert. linearity or foldover - V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, M1, M2
Vert. off freq. - V11
Horiz. off freq. - V12

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).





RESISTOR AND INDUCTOR IDENTIFICATION

ALTERNATE TUNER SCHEMATIC

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 5 volt bias supply to point Ⓐ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Pre-set A6 fully counter clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.0047 MFD	High side to pin1 (grid)of 3BZ6 (V3). Low side to chassis.	45MC	41.25MC	Any non-interfering Channel	Vert. Amp. thru 33K to point Ⓑ . Low side to chassis.	A1	Adjust to place marker in trap notch as in Fig. 1.
2.	"	"	"	44.0MC 45.3MC 42.7MC	"	"	A2, A3, A4	Adjust for maximum gain at marker frequencies.
3.	"	"	"	42.6MC 45.75MC	"	"		Adjust A2, A3 and A4 for response curve similar to Fig. 1 with markers as indicated.
4.	"	High side to point Ⓒ . Low side to chassis.	"	47.25MC	"	"	A5	Adjust to place marker in trap notch as in Fig. 1. Repeat step 3.
5.	1500MMF	"	"	42.6MC 45.75MC	"	"	A6, A7	Set sweep output for 3V peak to peak on scope. Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Repeat steps 1 and 4.
6.	Fig. 3	High side to ungrounded tube shield floating over mixer-osc. tube (V2). Low side to chassis.	Not used	45.75MC	"	USE VTVM. DC probe to point Ⓑ . Common to chassis.		Reduce bias to –4 volts. Adjust generator output for exactly 1 volt on VTVM. Remove pad (Fig. 3) but DO NOT change setting of output.
7.	"	"	"	41.25MC	"	"		Retouch A1 for 0.5 to 1.0 volts on VTVM.
8.	"	"	"	47.25MC	"	"		Retouch A5 for 0.5 volts or less on VTVM.

SOUND IF ALIGNMENT

Connect two matched 100K (±1%) resistors in series from point Ⓓ to chassis. The junction of these two resistors is alignment point Ⓔ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to point Ⓑ . Low side to chasais.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point Ⓓ. Common to chassis.	A8, A9	Adjust for maximum deflection with cores farthest apart.
10.	"	"	"	"	DC probe to point Ⓕ. Common to point Ⓔ.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	.01MFD	High side to point Ⓑ . Low side to chassis.	Not used	4.5MC (400∿ 30% AM Mod)	Any non-interfering channel	Vert. Amp. thru diode probe to pin 2 (cathode) of picture tube. Low side to chassis.	A11	Adjust for MINIMUM 400∿ indication.

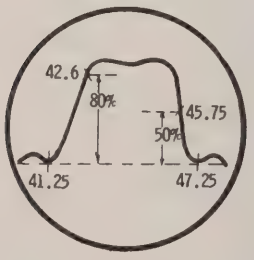


FIG. 1

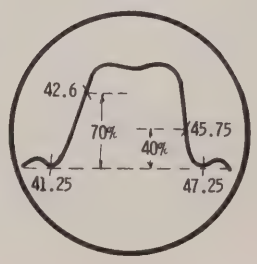


FIG. 2

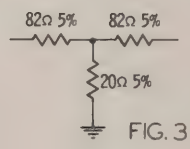


FIG. 3

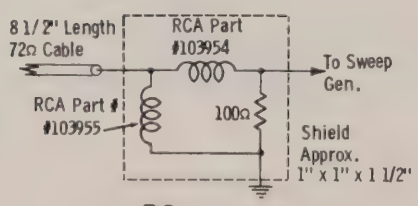


FIG. 4

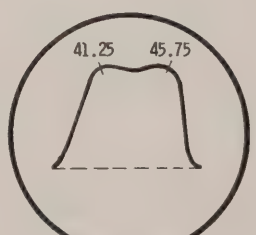


FIG. 5

ALIGNMENT INSTRUCTIONS (cont)

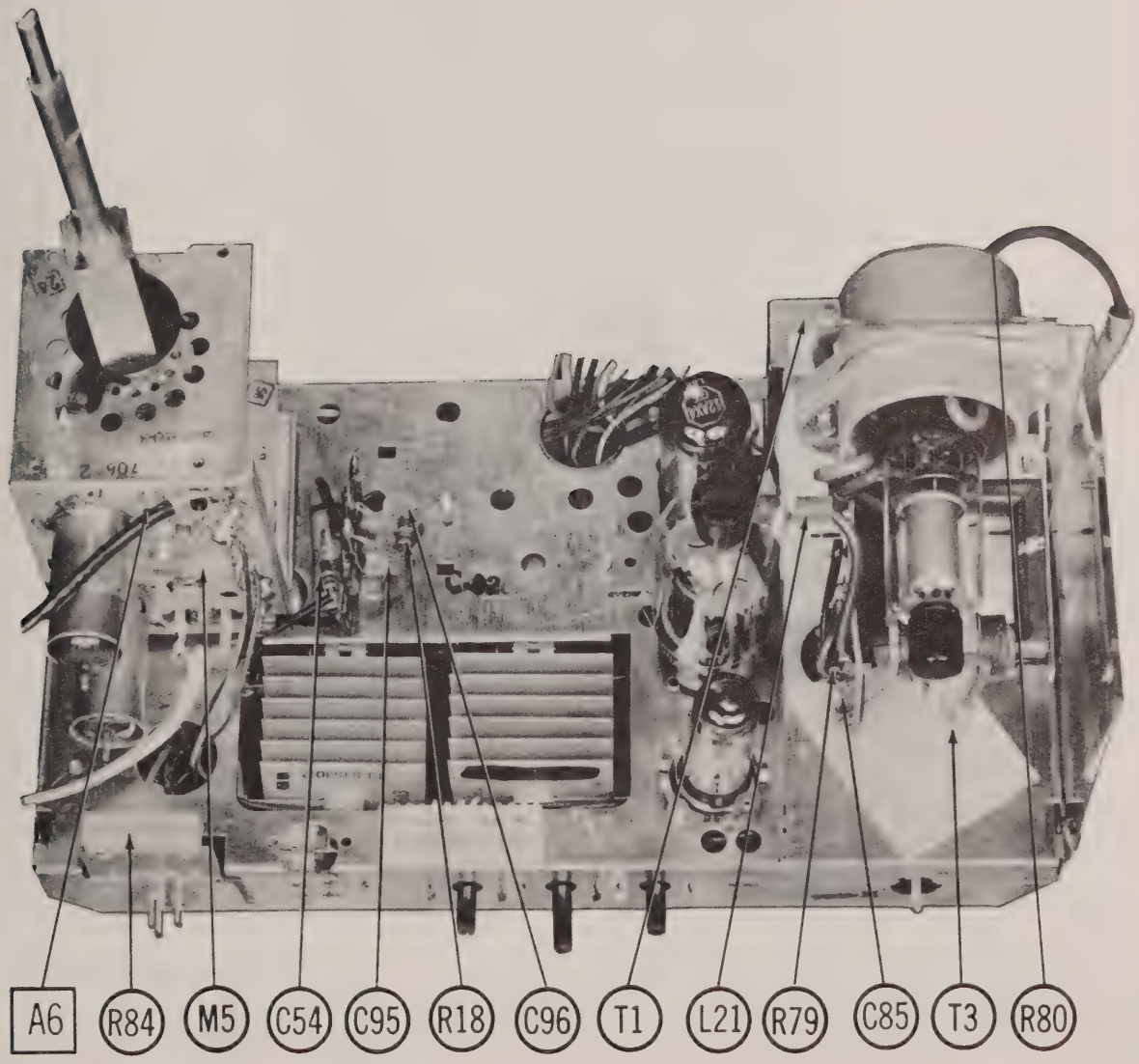
UHF IF ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓖ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

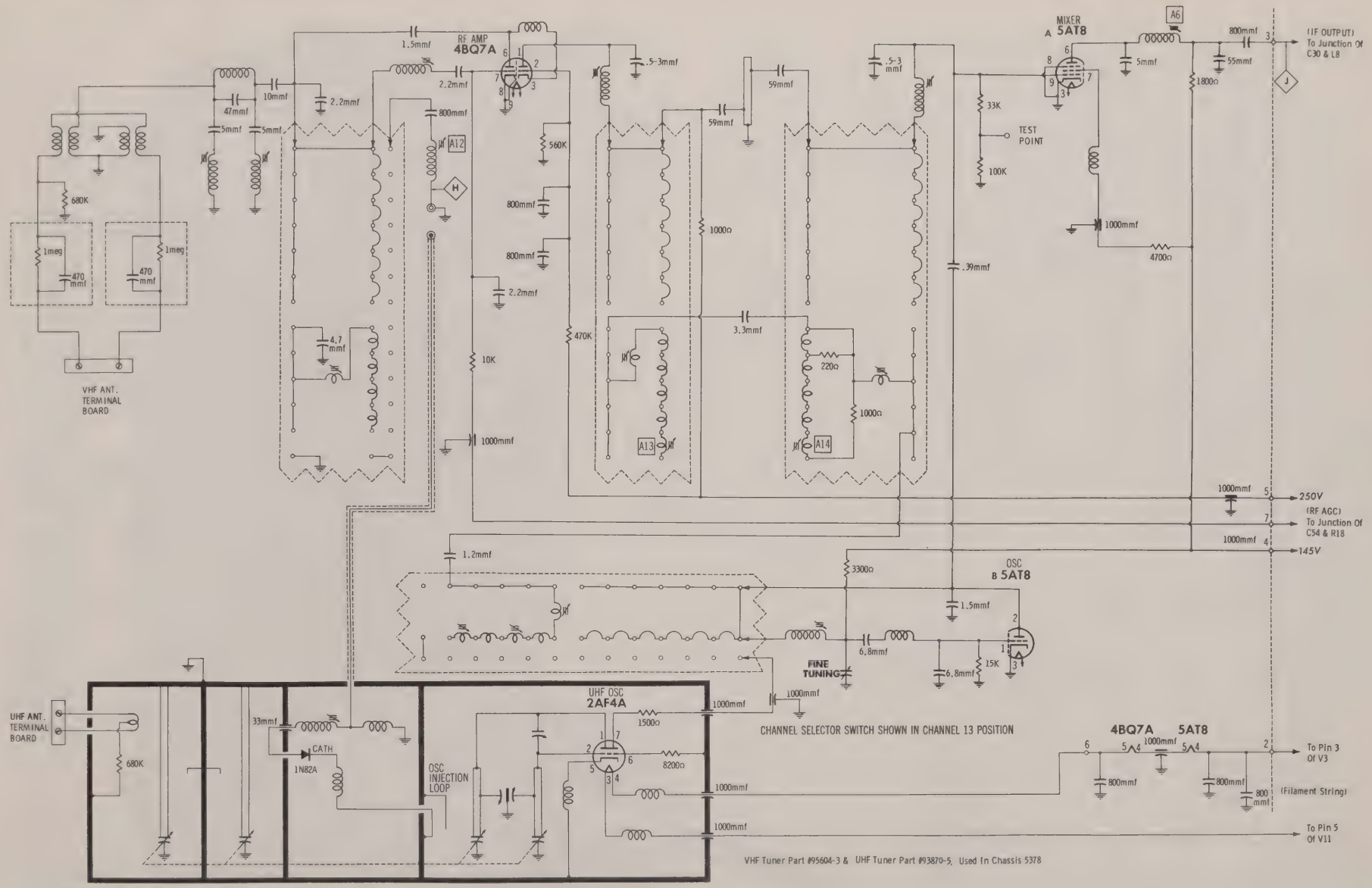
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Fig. 4	High side to point Ⓗ thru input head (Fig. 4). Low side to tuner chassis.	45.0MC	41.25MC 45.75MC	UHF	Vert. Amp. thru 1500MMF Cap. to pin 1 (plate) of 4BQ7A (Use diode probe on scope). Low side to chassis. Connect 220Ω resistor across scope terminals.	A12	Adjust for maximum gain and symmetry of response similar to Fig. 5 with markers as shown.
13.	"	"	"	"	"	Vert. Amp. thru diode probe to point Ⓙ. Low side to chassis.	A13, A14	Adjust for maximum gain and symmetry of response similar to Fig. 5 with marker as shown. Bandwidth is varied by altering position of these two coils with respect to each other. To make this adjustment observe pattern, switch to channel 9, make SLIGHT adjustment, then switch back to UHF to observe response.
14.	"	"	"	"	"	Vert. Amp. thru 33K to point Ⓑ. Low side to chassis.		Retouch A13 and A14 to obtain response similar to Fig. 2.

VHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



CHASSIS TOP VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

ALTERNATE TUNER SCHEMATIC

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CAPACITOR AND ALIGNMENT IDENTIFICATION

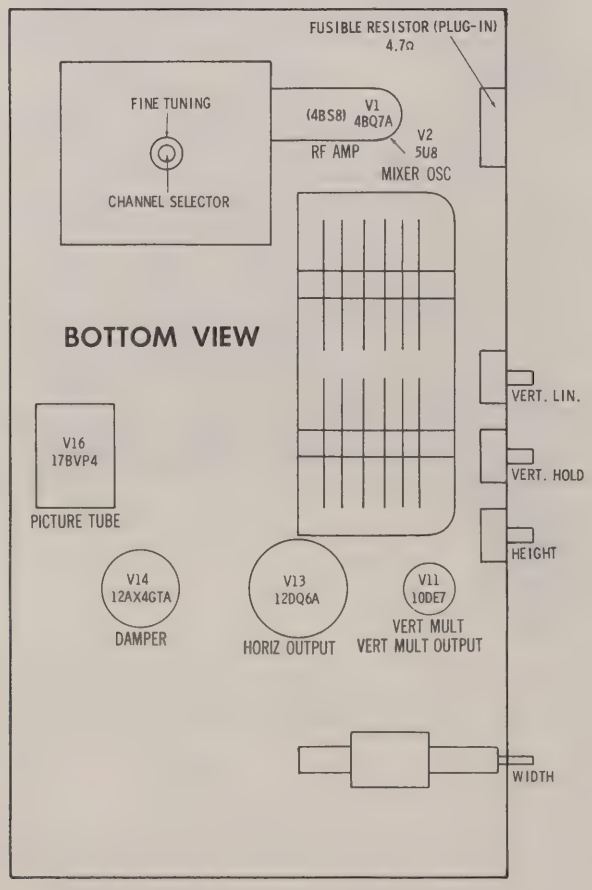
RCA VICTOR MODELS 17-S-7090, U, 17-S-7092, U, 17-S-7093, U, 17-S-7096, U (Ch. 5377, 5378)

FOLDER 4

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BQ7A	† 420Ω	370K	INF	12Ω	11Ω	INF	700K	0Ω	0Ω
V2	5U8	† 13K	165K	† 7000Ω	12Ω	13.5Ω	† 2400Ω	0Ω	0Ω	10K
V3	3BZ6	320K	47Ω	11Ω	10Ω	† 1900Ω	† 1900Ω	0Ω		
V4	3BZ6	.3Ω	180Ω	10Ω	9Ω	† 1900Ω	† 1900Ω	0Ω		
V5	3BZ6	.2Ω	180Ω	9Ω	8Ω	† 2900Ω	† 2900Ω	0Ω		
V6	12BY7A	27Ω	3300Ω	0Ω	5Ω	5Ω	3.5Ω	• † 5000Ω	† 1400Ω	0Ω
V7	5BR8	40K	180K	• 35K	3.5Ω	2.5Ω	† 15K	† 15K	150Ω	10K
V8	5T8	INF	27K	INF	1.5Ω	0Ω	† 550K	0Ω	10Meg	† 470K
V9	5AQ5	470K	270Ω	2.5Ω	1.5Ω	1000Ω	† 445Ω	470K		
V10	3CS6	† 1Meg	0Ω	7Ω	6.5Ω	† 25K	† 11K	1Meg		
V11	10DE7	† 220Ω	• 1.1Meg	NC	16Ω	13.5Ω	• ‡ 2.4Meg	• .3Meg	0Ω	470Ω
V12	6CG7	† 10K	2.8Meg	1000Ω	7Ω	8Ω	† 47K	120K	1000Ω	0Ω
V13	12DQ6A	TP	22Ω	TP	† 8400Ω	1Meg	TP	19Ω	0Ω	TOP CAP ‡ 13Ω
V14	12AX4GT	NC	TP	5Meg	NC	† 80Ω	TP	19Ω	16Ω	
V15	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡ 251Ω
V16	17BVP4		• 290K	5Ω	6.5Ω	23K	‡ 470K	‡ 470K		

† MEASURED FROM OUTPUT OF M2.
‡ MEASURED FROM PIN 3 OF V14.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE S:.
DENVER, COLORADO

CHASSIS BOTTOM VIEW

RCA VICTOR MODELS 17-S-7090, U, 17-S-7092, U, 17-S-7093, U, 17-S-7099, U (Ch. 5377, 5378)

FOLDER 4

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	4BQ7A	Note 1
V2	Mixer Osc.	5U8	
V3	1st. Video IF Amp	3B28	
V4	2nd. Video IF Amp	3B28	
V5	3rd. Video IF Amp	3B28	
V6	Video Output	12BY7A	
V7	Aud. Keying-Sound IF Amp	5BR8	
V8	Ratio Det.-AF Amp - Aud. Clamper	5T8	
V9	Audio Output	5AQ8	
V10	Sync Separator	5U8	
V11	Vert. Mult.-Vert. Output	10DE7	
V12	Horiz. Multi	6CG7	
V13	Horiz. Output	12DR8A	
V14	Damper	12AX4GT	
V15	HV Rectifier	1B3GT	

Note 1. A 4BS8 may be used in some versions.

PICTURE TUBE

ITEM No	REPLACEMENT DATA: RCA Victor PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V16	17BVP4	17BVP4 A	1. Silver screen. #3	

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA: RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	150	200	103805	PRG-400	XA0315	FP131	TD-200-150	S-150 +200 -150	TVA-1575
C1A	150	100	103806	PRG-260					
B	20	300							
C	100	25							
C2A	40	300	103846	AFH3-96-80					
B	60	300							
C	20	25							
C4	2	50	79181	PHR50V2	HBR2-50	TC302	TD-2-50	MT-0502	TVA-1301

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA: RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	6.8		103961	NPO-6I-6.8	TCC-6R8	C10V8BC	TCO-6.8	ZT-5S6R8	STCCB-V68	5% NPO
C6	1000		103970	EF-001	MFT-1000				502C-D8	
C7	25			NPO-6I-25	TCZ-25	C10Q25C	TCO-25		STCC-Q25	NPO
C8	3.3		103968	NPO-6I-3.3	TCR-3.3	C10V3C	TCO-3.3	ZT-5S33	STCCB-V33	5% NPO
C9	680		102331				SD-680			10%
C10	5-3		103998		S2B-3		5U8-D	CT-5S5A		
C11	1000		103970	EF-001	MFT-1000				502C-D1	
C12	47		103960							5% N1500
C13	2-2									
C14	11		103969							10%
C15	25		103969	N750-6I 25	TCN-25	C10Q25U	TCT-25		STCU-Q25	5% N750
C16	18		78442							10%
C17	5-3		103967		S2B-3		5U8-D	CT-5S5A		
C18	10		103965							5% NPO
C19	1000		103970	EF-001	MFT-1000				502C-D1	
C20	1000		77324	BPD-001	DD-103	BYA5DI	ED-1000	DCS2I	5HK-D1	
C22	39		103963							5% N1500
C23	5		103963							N1500
C24	10		103963	N750-6I 10	TCN-10	C10Q1U	TCT-10	NT-5A1	STCU-Q1	5% N750
C25	2		103968							5%
C26	1000		103970	EF-001	MFT-1000				502C-D1	
C27	1000		103970	EF-001	MFT-1000				502C-D1	
C28	1000		103970	EF-001	MFT-1000				502C-D1	
C29	1000		103970	EF-001	MFT-1000				502C-D1	
C30	8.2		103950	NPO-6I-8.2		C10V8BC	TCO-8.2			5%
C31	2		103948							10%
C32	1000		103970	BPD-001	DD-103	BYA5DI	ED-1000	DCS2I	5HK-D1	
C33	22	100	100650	P388N-33		CUB1P33		GEM-2023	37M-P33	
C34	470		78198		D6-47L	LJ0747	ED-470			10%
C35	47		103969-000047	DD-470	LJ0Q47	ED-47	UC-5447	3GA-Q47		
C36	560		79686			ED-560				10%
C37	270		103949	NPO-6I 270	TCS-270		TCO-270			5%
C38	800		103268							10%
C39	1000		77263	BPD-001	DD-103	BYA5DI	ED-1000	DCS2I	5HK-D1	
C40	1000		77252	BPD-001	DD-102	BYA5DI	ED-1000	DCS2I	5HK-D1	
C41	1000		77251	BPD-001	DD-101	BYA5DI	ED-1000	DCS2I	5HK-D1	
C42	10		103947	NPO-6I 10	D6-100	L10Q1	ED-10	ZT-5A1	STCC-Q1	10%
C43	10		103947	NPO-6I 10	D6-100	L10Q1	ED-10	ZT-5A1	STCC-Q1	10%
C44	022	200	79935							10%
C45	150		103952	NPO-6I 150	D6-151	LJ0715	ED-150			10%
C46	68		103957	1469-000068		22S5Q68			MS-468	10%
C47	22	400	78923	P468N-33		CUB4P33		GEM-4022	47M-P33	
C48	047		103955	1469-0001		22S5T1			MS-31	10%
C49	4700		73473	BPD-0047	DD-472	BYA1DD47	ED-0047	UC-5247	5HK-D47	
C50	4700		73473	BPD-0047	DD-472	BYA1DD47	ED-0047	UC-5347	5HK-D47	
C51	0047	600	72920					GEM-1647	47M-P47	10%
C52	15	200	103904	P388N-15		CUB2P15		GEM-2015	27M-P15	
C53	47	100	78418	P388N-47		CUB2P47		GEM-2047	27M-P47	
C54	1	200	78931	P388N-1	DF-104	CUB2P1		GEM-201	27M-P1	
C55	2200	1000	103455	BYF-15-2200	D289-222	BYA1DD22	HD15-2200	DC5Q222	5GA-D22	
C56	047	400	78921-A	BPD-05	DF-503	CUB4S47		GEM-4147	47M-S47	
C57	047	600	78921-A	BPD-05	DF-503	CUB4S47		GEM-4147	47M-S47	
C58	68	400	78923	P468N-1	DF-104	CUB4P1		GEM-4101	47M-P1	
C59	01	200	102000					GEM-1611		10%
C60	001	600	103908							10%
C61	033	400	73552							10%
C62	0022	200	102179							10%
C63	047	400	73553	BPD-05	DF-503	CUB4S47		GEM-4147	47M-S47	
C64	1	400	78923	P468N-1	DF-104	CUB4P1		GEM-401	47M-P1	
C65	47	200		P388N-47		CUB2P47		GEM-2047	27M-P47	
C66	22	600	102178	P688N-33		CUB6P22		GEM-6022	67M-P22	
C67	100		103956	1469-0001	DD-101	22S5T1	ED-100	MCB2S5	MS-31	10%
C68	82		103899	1469-000082	DD-802	22S5Q82	ED-82		MS-482	10%
C69	1000		102234							10%
C70	1000		102234							10%
C71	1000		102234	BPD-05	DF-503	CUB4S47	GEM-4147		47M-S47	
C72	047	600	78923-A							10%
C73	.0047	200	103721							10%
C74	330		103906	1469-00033	D6-331	22S5T33	ED-330		MS-333	10%
C75	100		103900	1469-0001	D6-101	22S5T1	ED-100	MCB2S5	MS-31	10%

CAPACITORS (cont)

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA: RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C76	680		103954	1464-00068		1H5T68			MS-368	5%
C77	.0047	600	103962						GEM-16347	10%
C78	4700				BPD-0047	DD-472	BYA1DD47	ED-0047	UC-5347	5HK-D47
C79	047	400	73553		BPD-05	DF-503	CUB4S47		GEM-4147	47M-S47
C80	022	200	73562		BPD-02	DD-303	CUB4S22	ED-02	GEM-4123	47M-S22
C81	470	4000	103902		HVD-50-470	D060-471	HVB50T47	HD6-470		
C82	033	600	73556		BPD-03		CUB4S33		GEM-6133	67M-S33
C83	027	600	75345							10%
C84	01	600	73549		BPD-01	DD-103 D330-s20	CUB4S1	GP-10000	GEM-611	67M-S1
C85	82	3000								
C86	1000	900	103896		HVD-15-1000	DD-103	BYA1DDI	HD15-1000	DC5Q31	5GA-D1
C87	1000	900	103899		HVD-15-1000	DD-103	BYA1DDI	HD15-1000	DC5Q31	5GA-D1
C88	1000		77252		BPD-001	DD-103	BYA5DI	ED-1000	DCS2I	5GA-D1
C89	1000		77252		BPD-001	DD-103	BYA5DI	ED-1000	DCS2I	5GA-D1
C90	1000		77252		BPD-001	DD-103	BYA5DI	ED-1000	DCS2I	5GA-D1
C91	1000		77252		BPD-001	DD-103	BYA5DI	ED-1000	DCS2I	5GA-D1
C92	1000		77252		BPD-001	DD-103	BYA5DI	ED-1000	DCS2I	5GA-D1
C93	4700		73473		BPD-0047	DD-473	BYA1DD47	ED-0047	UC-5347	5GA-D47
C94	5000	600	103804		HVD-15-47000	DD-473	BYA1DD47	HD15-47000		5GA-D5
C95	4700	1000	103905		HVD-15-4700	DD-473	BYA1DD47	HD15-4700		5GA-D47
C96	4700	1000	103905		HVD-15-4700	DD-473	BYA1DD47	HD15-4700		5GA-D47

Note 1. Not used in some versions

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Vert. Output	103529	21900 ① ②				A-8148 ②	28S75 ① ②	118X ①
T2A	Yoke-Horiz (20 5MH)	103530		MDF-110					
B	(90°)-Vert (32 5MH)								
T3	Horiz Output	103539		HVO-126					
T4	Width Coil (20-47MH)	103811							

① Use 8 to 1 turns ratio
② Connect as autotransformer.
③ Drill new mounting hole(s).

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No	INSTALLATION NOTES
R1	250K	1	103868					Volume
R2	15K	1	103871					Contrast-Tap ② 500Ω
R3A	10meg	1	103869	B-68	A47-1Meg-S	QI-127	U64	Brightness
B	Shaft			Not Req.	K3R-3	Not Req.	Not Req	
C	Switch			KB-1	SWE-11		U5-25	
R4A	1Meg	½	103813	AB-68	A47-1Meg-S	QI-127	PTA1S41	Vert. Lin.
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R5A	1.5Meg	½	103815	AB-743	A47-1.5Meg-S	QI-126	PTA2S1	Vert. Hold
B	Shaft			AK-19	RN-3	TQ	Not Req	
R6A	2.5Meg	½	103815	AB-68	A47-2.5Meg-S	QI-239		Height
B	Shaft			AK-19	RN-3	TQ		
R7	150K	1	103870					AGC

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA: RCA Victor PART No.	CENTRALAB PART No.	IRC PART No.	NOTES
R9	10K		103310	BTS-10K		
R9	680K		103468	BTS-680K		
R10	820K		103469	BTS-820K		
R11	150K		103415	BTS-150K		
R12	15K		103405	BTS-15K		
R13	5600Ω		103255	BTS-5600		
R14	1000Ω		103210	BTS-1000		
R15	4700Ω		103247	BTS-4700		
R16	10K		103310	BTS-10K		
R17	15K		103312	BTS-15K		
R18	47K		103247			Note 1
R19	3.3Meg 5%					
R20	470K 5%		103447			
R21	200K 5%		103410			Note 2
R22	100K 5%		103410			Note 3
R23	330K		103413			
R24	68000 5%		103268			Note 4
R25	470Ω		103247	BTS-470		
R26	47Ω		103047	BTS-47		
R27	8300Ω		103263	BTS-8300		
R28	470Ω		103247	BTS-470		
R29	180Ω		103218	BTS-180		
R30	18K		103218	BTS-18K		
R31	1000Ω		103210	BTS-1000		
R32	470Ω		103247	BTS-470		
R33	180Ω		103218	BTS-180		
R34	33000 5%		103233	BTS-3300 5%		
R35	10K		103310	BTS-10K		
R36	39K		103239	BTS-39K		
R37	3300Ω	3	103177	PWT-3300		
R38	2700Ω	4	103278			
R39	27Ω		103231	BTS-27		
R40	270K		103247	BTS-270K		
R41	470K		103447	BTS-470K		
R42	47K		103247	BTS-47K		
R43	150K		103415	BTS-150K		
R44	10K		103310	BTS-10K		
R45	15K	2	103215	BTS-15K		
R46	150Ω		103215	BTS-150		
R47	27K		103227	BTS-27K		

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	NOTES
R48	4700	2	103247	BTS-470	
R49	3700	1	103237	BTA-370	
R50	10K		103310	BTS-10K	
R51	15Meg 5%		103510	BTS-15Meg 5%	
R52	150K	1	103310	BTA-150K 5%	Note 1
R53	37K		103237	BTS-37K	Note 3A
R54	100K 5%		103410	BTS-100K 5%	Note 5
R55	47K		103247	BTS-47K	Note 6
R56	33K		103233	BTS-33K	
R57	1.5Meg		103511	BTS-1.5Meg	
R58	3.9Meg		103519	BTS-3.9Meg	Note 7
R59	1Meg		103510	BTS-1Meg	
R60	18K		103218	BTS-18K	
R61	470Ω	2	103247	BTS-470	
R62	2200Ω		103222		
R63	2200Ω		103222		
R64	820K		103462		
R65	1Meg		103510		
R66	2700Ω		103227	BTS-2700	
R67	2200Ω		103222		Note 1
R68	1Meg		103510		
R69	47K		103247		
R70	10K	1	103310		Note 1
R71	180K 5%		103415	BTS-180K 5%	
R72	2700Ω		103227		
R73	47K		103247		
R74	1000Ω 5%		103210	BTS-1000 5%	
R75	220Ω		103213	BTS-220	
R76	1Meg		103510	BTS-1Meg	
R77	220Ω		103213	BTS-220	
R78	8200Ω	3	103263	BTS-8300	
R79	47000		103247		
R80	47000		103247		
R81	470K		103523		
R82	10000Ω	10	103522	PW10-1000	Note 8
R83	390Ω	5	103521		
R84	4.7Ω	20	103524		
R85	470		103523		
R86	33000		103233	BTS-3300 5%	Note 1
R87	33000		103233	BTS-3300 5%	Note 1
R88	470K		103447	BTS-470K	

Note 1. Manufacturer recommends 5% replacement.
Note 2. Some versions may use 180K, 5% (Part #103415) in this application.
Note 3. Some versions may use 56K, 5% (Part #103356) in this application.
Note 4. Some versions may use 33000Ω, 5% (Part #103233) in this application.
Note 5. Some versions may use 220K, 5% (Part #103412) in this application.
Note 6. Some versions may use 82K (Part #103282) in this application.
Note 7. Not used in some versions.
Note 8. Special temperature compensating unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	5200Ω	3-4Ω	103904	Z1110	A-3028	A-3328	24S48	S-6X	

SPEAKER

ITEM No	TYPE SIZE	TYPE FIELD	TYPE V C IMP	REPLACEMENT DATA: RCA Victor PART No.	QUAM PART No.	NOTES
SP1	4	PM	3-4Ω	104158	4A07	

COILS (RF-IF)

ITEM No.	USE	RCA Victor PART No.	NOTES
L1	Ant. Trans.	103971	
L3	Ant. Coils	103966	Channels 2-13, complete wafer assy.
L5	RF Coils	103968	Channels 2-13, complete wafer assy. includes C2 and C14
L4	Mixer Grid Coils	103967	Channels 2-13, complete wafer assy. includes C15, C24, C13, C16, R11, R12, R3
L6	Osc. Coils	103965	Channels 2-13, complete wafer assy
L6	Mixer Plate Coil	103974	

ITEM No	USE	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L7	47.25MC Trap	103554				
L8	1st. Video IF	103863				
L9	Fil. Choke		19-1000	BC-581	6603	1. 2 Microhenries
L10	2nd. Video IF	103867				Includes 41.25MC Trap
L11	Fil. Choke		19-1000	BC-581	6603	1. 2 Microhenries
L12	3rd. Video IF	103865				
L13	Fil. Choke		19-1000	BC-581	6603	1. 2 Microhenries
L14	4th. Video IF	103866				Includes 4.18MF Cap.
L15	RF Choke	103810	19-1005	BC-586	6613	12 Microhenries
L16	RF Choke	103810	19-1005	BC-586	6613	12 Microhenries
L17	Shunt Peaking Coil	103859	19-2300	TV-180	6131	235 Microhenries
L18	Series Peaking Coil	103860	19-3180	TV-184	6130	160 Microhenries
L19A	4.5MC Trap	103868			6303PC	
B	Sound IF				6303PC	
L20	Ratio Det.	103884			6305PCa	Includes resistors and Capa.
L21	Choke	*				12 Microhenries
L22	RF Choke	103805	19-1005	BC-586	6613	12 Microhenries
L23	RF Choke	103805	19-1005	BC-586	6613	12 Microhenries
L24	Line Choke	103814				119 Microhenries
L25	Line Choke	103814				119 Microhenries

* Part of tube cap. and lead assembly of V13 (Part #103840).
▲ Connect 100K across primary, 470Ω from tertiary winding to de-emphasis plate

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L26	40Ω		103861							U-35 Milliseries

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 Cy.	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No	Merit PART No.	Stancor PART No.	Thordarson PART No	Triad PART No
L27	310A	33Ω	1 HY.	103809	C-3902 ①	C-3900 ①	C-3238 ①	26C64 ①	C-17X ①

① Drill one new mounting hole

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	RCA Victor PART No	REPLACEMENT DATA
K1	Antenna Isolation	470MMF, 1Meg	103841	Centralab RC-471
K2	Antenna Isolation	470MMF, 1Meg	103841	Centralab RC-471
K3	De-Emphasis	1000MMF, 4000MMF, 10000MMF, 22K	103878	Centralab PC-188
K4	Audio Coupling	5000MMF, 2500MMF, 5000MMF, 10Meg, 470K, 470K	103875	
K5	Vertical Retrace	10000MMF, 3300MMF, 15K, 22K, 47K, 22K	103873	
K6	Sync Separator	370MMF, 10000MMF, 330K, 1Meg	103874	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA: RCA Victor PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	NOTES
M1	.310A	103820 ①	1179A ①	1N1008 ②	R2450SL ①	6S450 ①	500 ↕	
M2	.310A	103820 ①	1179A ①	1N1008 ②	R2450SL ①	6S450 ①	500 ↕	
M3		103972 ①	1215 ① ②		1T1 ① ②			

① Selenium type. ② Germanium type. ↕ As Required

RCA VICTOR MODELS 17-S7090, U, 17-S-7092, U, 17-S-7093, U, 17-S-7095, U (Ch. 5377, 5378)

FOLDER 4

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		RCA Victor PART No.	CBS PART No.	SYLVANIA PART No.	
M4	1N295	101615	1N34A	1N60	Video Detector

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M5	Tuner	95359-3	VHF - Ch. 5377
	Tuner	95604-4	VHF - Ch. 5377
	Tuner	95604-3	VHF - Ch. 5378
	Tuner	93870-5	UHF - Ch. 5378
M6	Centering Device		Part of Yoke Assy.
M7	Ion Trap	103779	

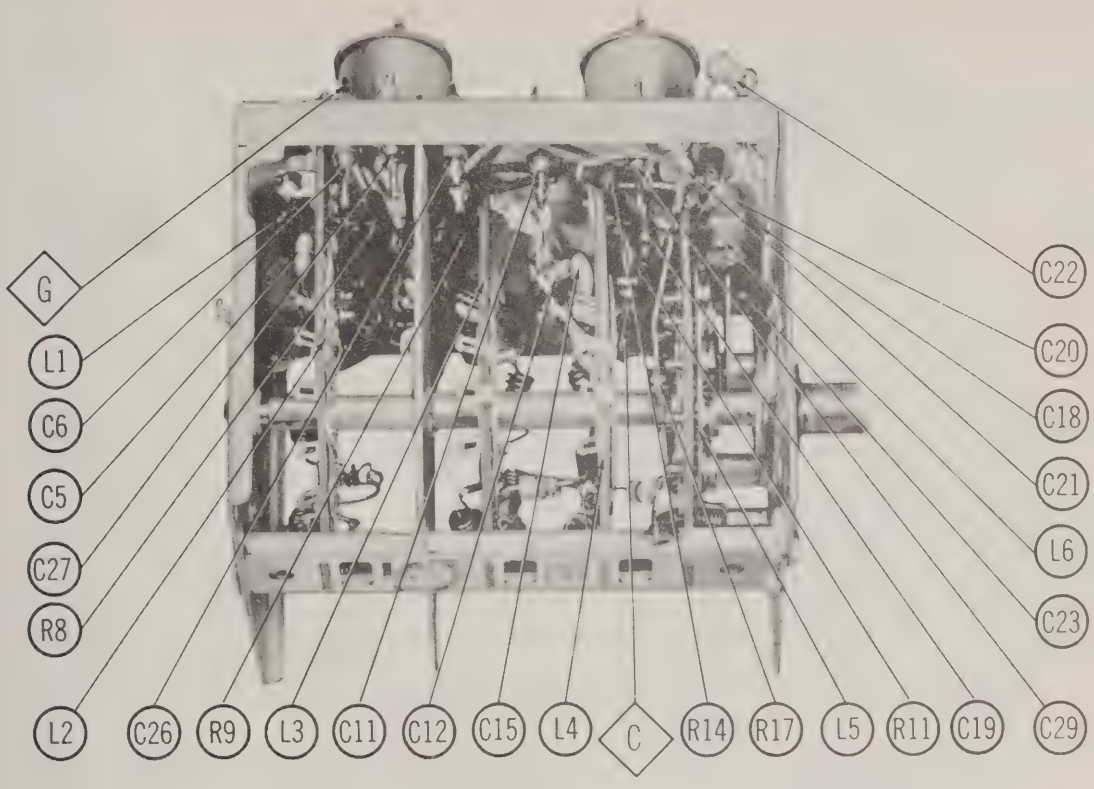
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

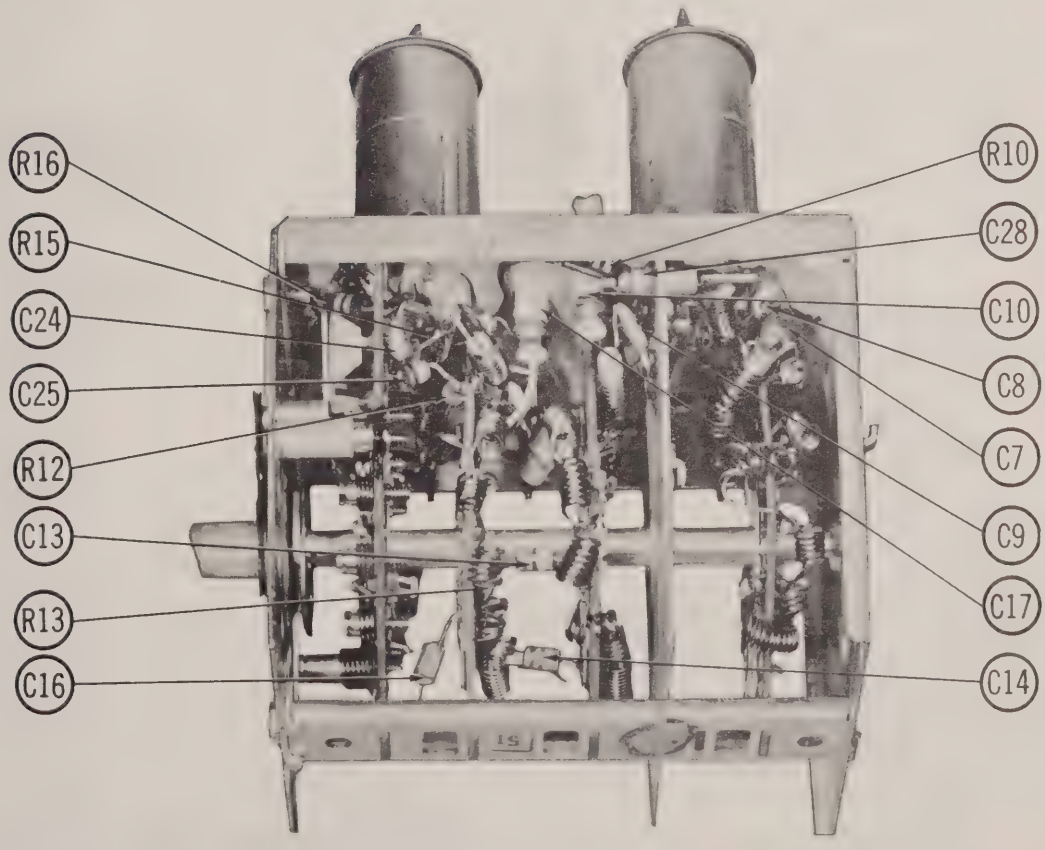
NAME	PART NO.	DESCRIPTION
Safety Glass	103786	Includes mask assembly
Knob	103782	Channel Selector
Knob	103784	VHFFine Tuning (Models 17S7090, 17S7092, 17S7099)
Knob	103799	VHF Fine Tuning (Model 17S7093)
Knob	103936	UHF Channel Selector & VHF Fine Tuning (Models 17S7090U, 17S7092U, 17S7099U)
Knob	103937	UHF Channel Selector & VHF Fine Tuning (Model 17S7093U)
Knob	103934	UHF Fine Tuning (Models 17S7090U, 17S7092U, 17S7099U)
Knob	103935	UHF Fine Tuning (Model 17S7093U)
Knob (Inner)	103783	On-off and brightness
Knob (Outer)	103785	On-off and brightness (Models 17S7090,U, 17S7092, U, 17S7099, U)
Knob (Outer)	103800	On-off and brightness (Model 17S7093, U)
Knob	103781	Contrast and volume (Models 17S7090, U, 17S7092, U, 17S7099, U)
Knob	103798	Contrast and volume (Models 17S7093, U)
Handle	103717	Black (Models 17S7090, U, 17S7092, U, 17S7099, U)
Handle	103085	Red (Models 17S7093, U)

TURN BOTH FINE TUNING CAM
AND UHF PULLEY FULLY COUNTER-CLOCKWISE

UHF DRIVE CORD STRINGING

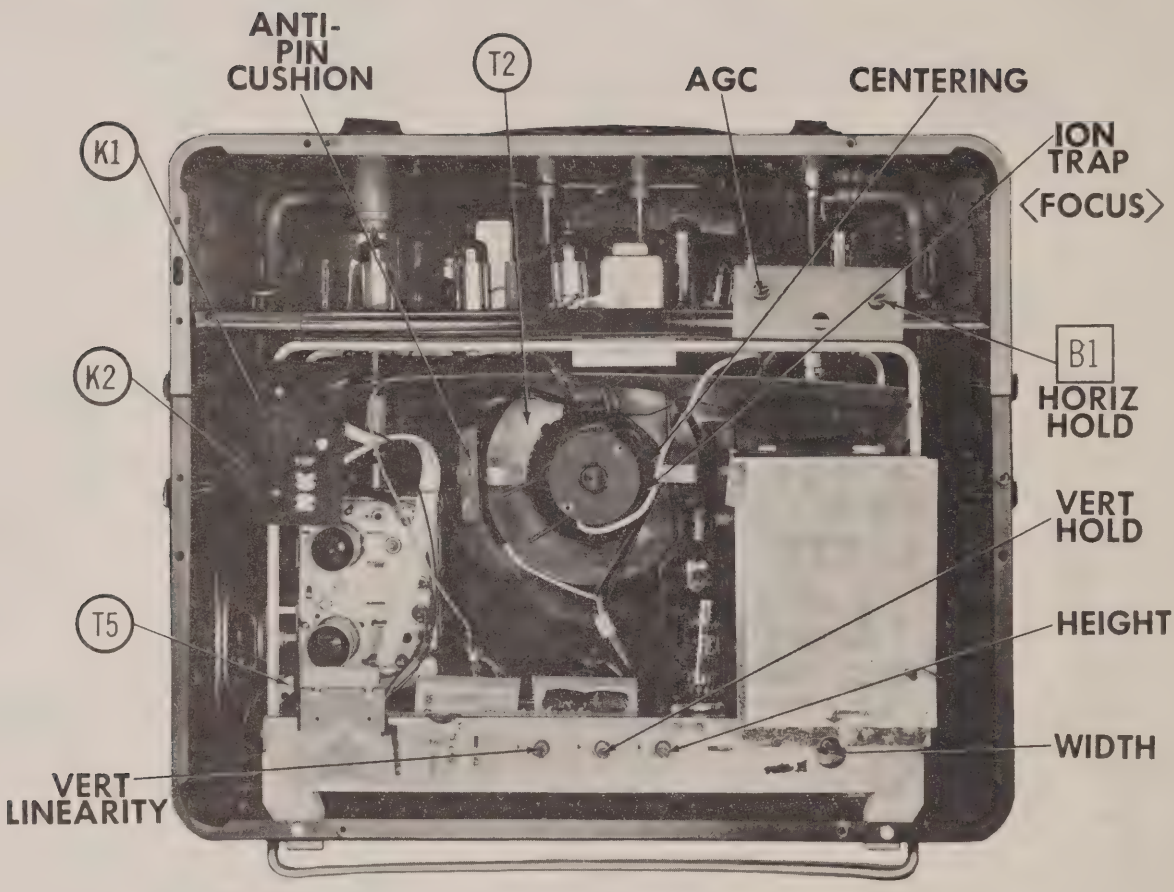


RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

FOLDER 4



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the brightness and contrast controls for a normal picture.

Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.

Adjust width slug (B1) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

PHOTOFACT* Folder

*TRADE MARK

TRUETONE MODELS 2D1720A, B, 2D1721A, B, 2D1724A, B, 2D2726A, B, 2727A, B, 2D2728A, B

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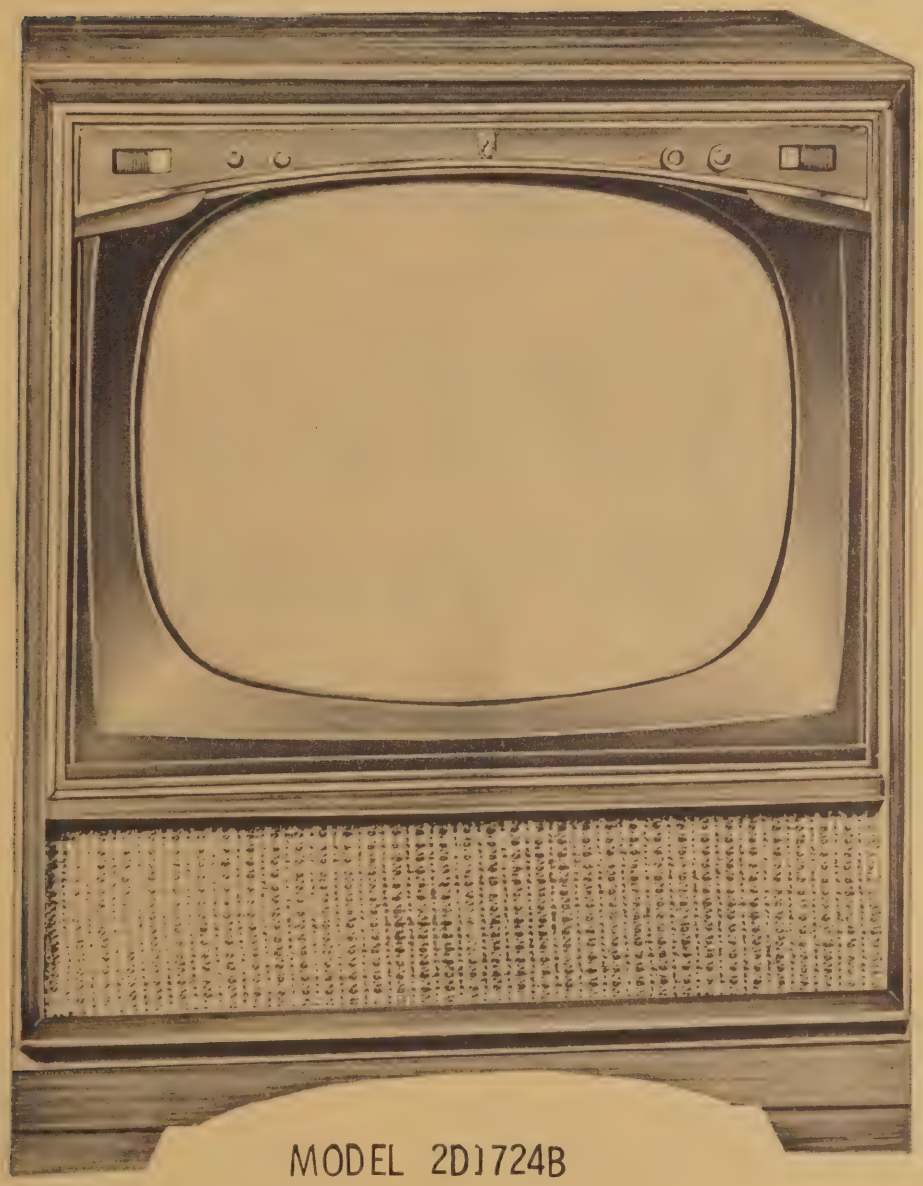
3924 MEADE ST.
DENVER, COLORADO



MODEL 2D1724B

TRUETONE MODELS 2D1720A, B, 2D1721A, B, 2D1724A, B, 2D2726A, B, 2727A, B, 2D2728A, B

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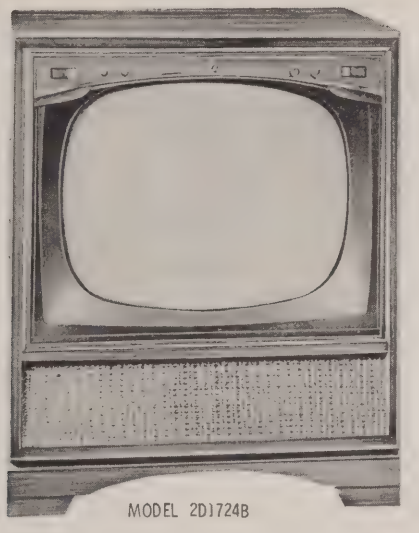
FOLDER 5

PHOTOFACT* Folder

*TRADE MARK



MODEL 2D1724B

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TRUETONE MODELS 2D1720A, B, 2D1721A, B, 2D1724A, B, 2D2726A, B, 2727A, B, 2D2728A, B

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

TRADE NAME	Truetone Models 2D1720A, B, 2D1721A, B, 2D1724A, B, 2D2726A, B, 2D2727A, B
SUPPLIER	Western Auto Supply Co., 2107 Grand Avenue, Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	Fifteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 175 Watts, 1.5 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

1. Remove 7 push-on type control knobs from the front. NOTE: On power tuning models DO NOT attempt to remove on-off or channel buttons.
2. Remove 4 metal screws and the escutcheon.
3. Remove the metal screws and the safety glass clamps at the top.
4. Remove the safety glass.

FOCUS

The focus may be varied in steps by the position of a wire in the focus adjustment board. This requires a soldered connection. Readjust the Ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate audio detector buzz, adjust the buzz control for MINIMUM buzz and maximum sound. (For location see tube placement chart).

FUSES

A circuit breaker is used for LV power supply protection. (For placement see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

ANTI-PIN CUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible. Position 2 magnets so that all sides are straight.

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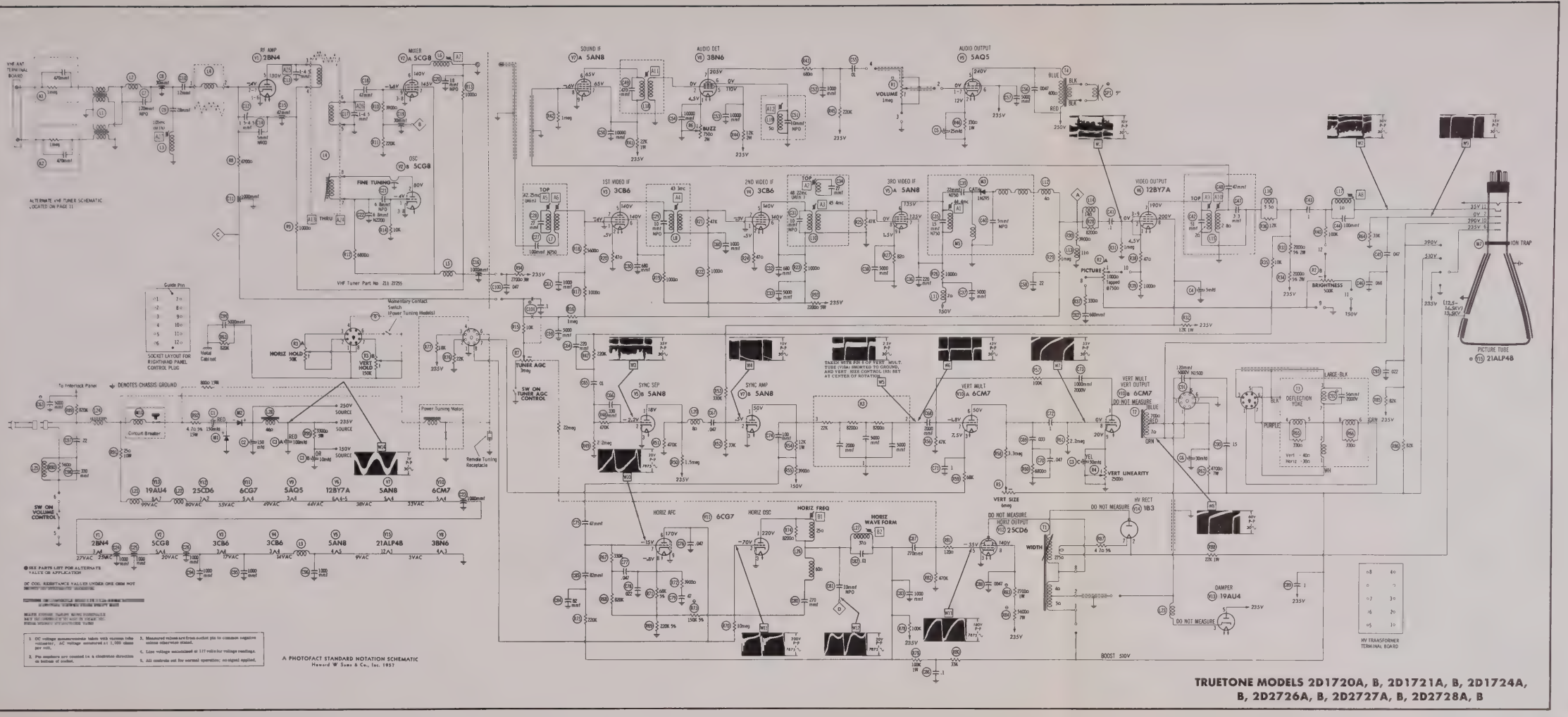
G892R

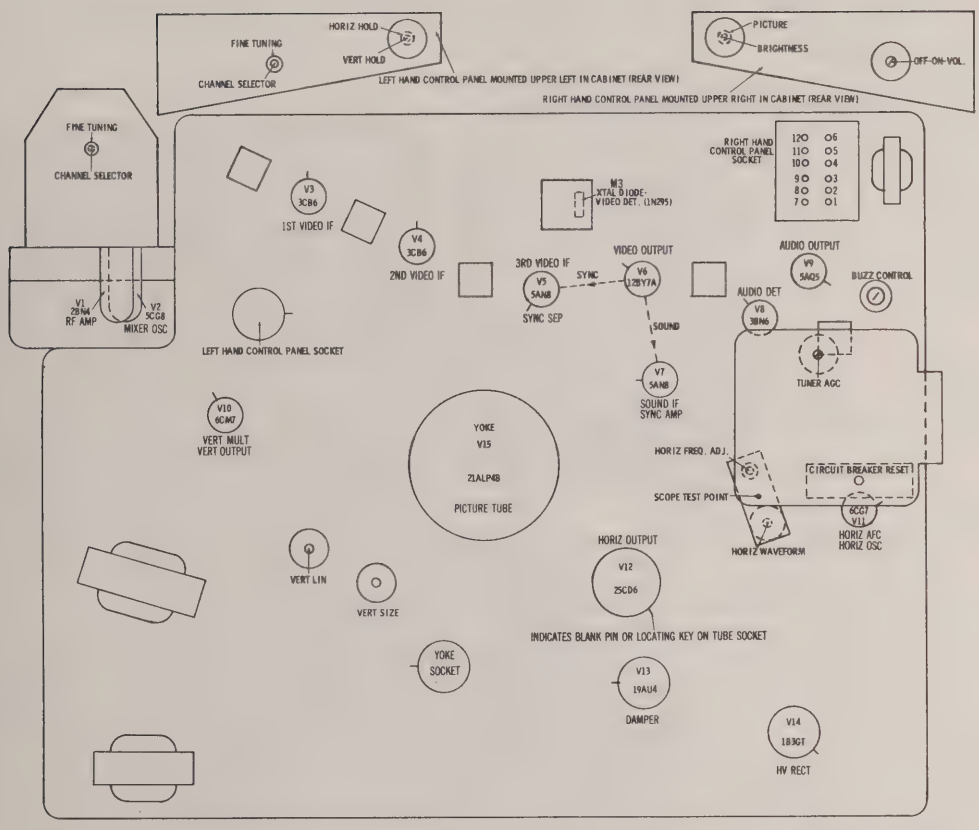
DATE 10-57 SET 375 FOLDER 5



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W Sams & Co., Inc. 1957

TRUETONE MODELS 2D1720A, B, 2D1721A, B, 2D1724A, B, 2D2726A, B, 2D2727A, B, 2D2728A, B

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

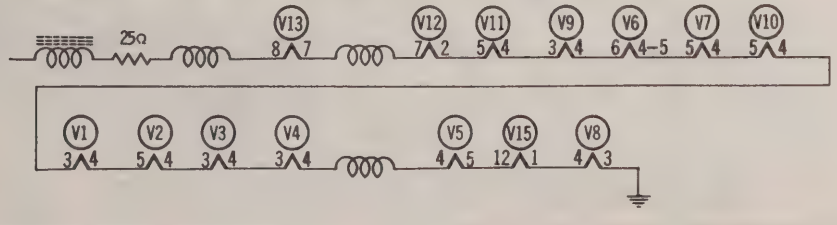
POWER SUPPLY FAILURE
No raster, no sound - Circuit Breaker (M10), Rectifier (M1, M2)

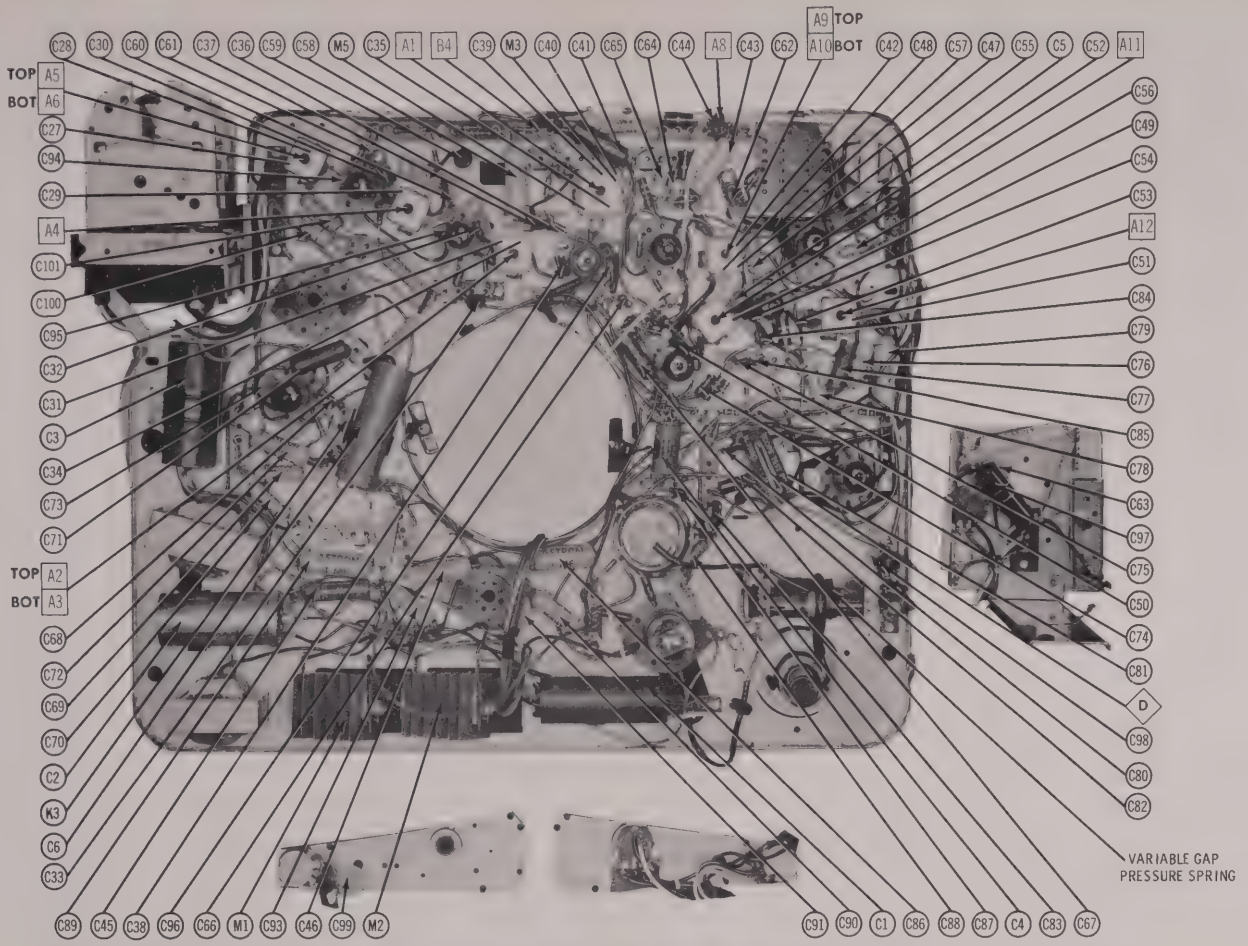
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, Diode (M3), V8
No pic, no sound, has snow - V1, V2
No pic, has sound, has raster - V6, V15
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V5, V7
No horiz. sync - V5, V7, V11
No vert. or horiz. sync - V5, V7

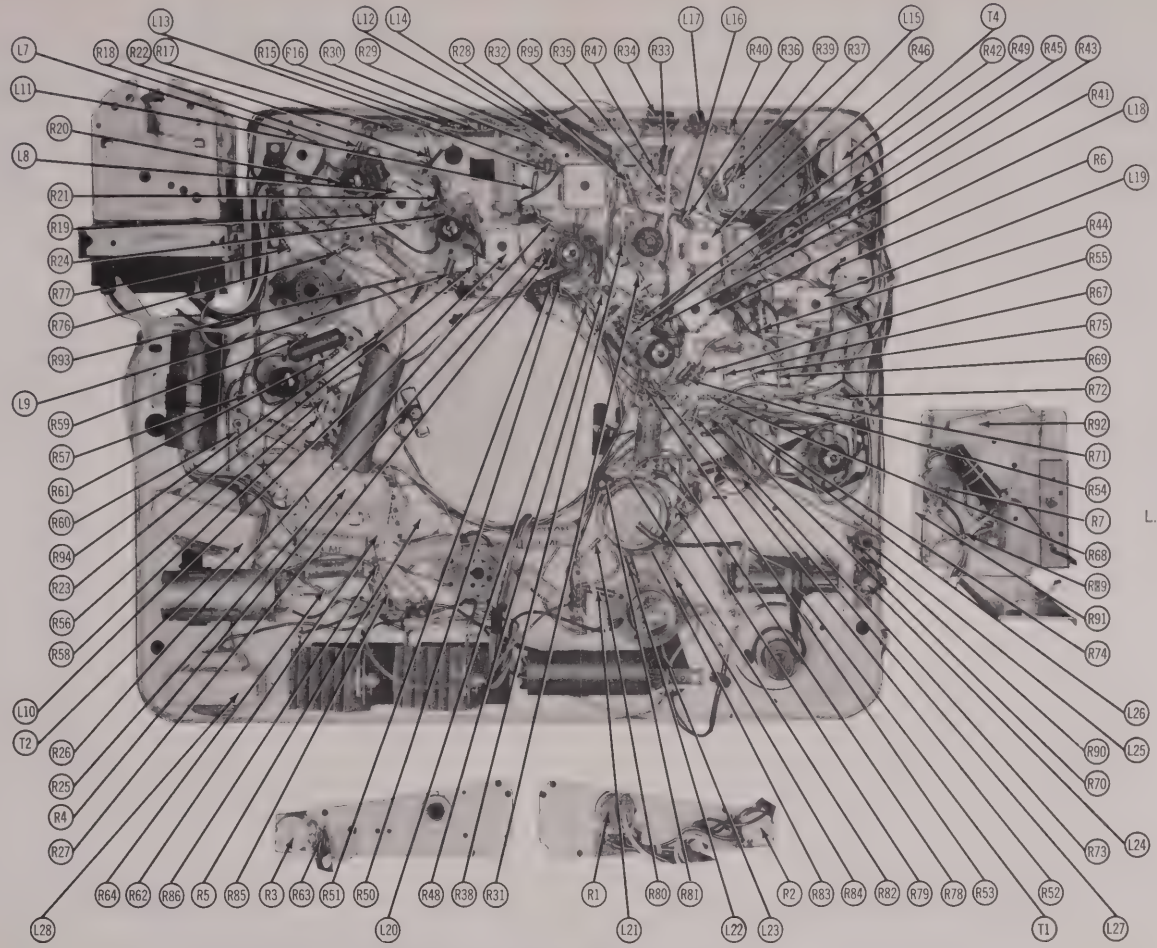
SWEEP FAILURE
No raster, has sound - V11, V12, V13, V14, V15
No vertical deflection - V10
Poor vert. linearity or foldover - V10
Poor horiz. linearity or foldover - V11, V12, V13
Narrow picture - V11, V12, V13, M1, M2
Vert. off freq. - V10
Horiz. off freq. - V11

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).





CAPACITOR AND ALIGNMENT IDENTIFICATION



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RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect a 1000MMF capacitor across the scope terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MMF	High side to pin 1 (grid) of 3CB6 (V3). Low side to chassis.	Not used	44.4MC (Unmod)	10	USE VTVM. DC probe to point (A). Common to chassis.	A1	Attenuate generator output to maintain not more than 2 volts at VTVM. Adjust for maximum deflection.
2.	"	"	"	48.22MC	"	"	A2	Adjust for MINIMUM deflection.
3.	"	"	"	45.4MC	"	"	A3	Attenuate generator output to maintain not more than 2 volts at VTVM. Adjust for maximum deflection. Repeat step 2.
4.	"	"	"	43.3MC	"	"	A4	Attenuate generator output to maintain not more than 2 volts at VTVM. Adjust for maximum deflection.
5.	"	"	44.0MC	43.65MC 46.75MC	"	Vert. Amp. thru 10K to point (A). Low side to chassis.		Adjust A1 for flat-top response.
6.	"	"	"	"	"	"		Check for response curve similar to Fig. 1 with markers at 40%. If curve is not correct, repeat steps 1 thru 3.
7.	"	High side to point (B). Low side to chassis.	Not used	42.25MC	"	USE VTVM. DC probe to point (A) Common to chassis.	A5	Use only enough generator output to provide usable indication on VTVM. Adjust for MINIMUM deflection.
8.	"	"	44.0MC	43.65MC 46.75MC	"	Vert. Amp. thru 10K to point (A). Low side to chassis.	A6, A7	Adjust for response similar to Fig. 2 with markers at 50%.

4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust the fine tuning until sound bars just appear in the picture.
Adjust A8 fully counter clockwise, then clockwise until the horizontal scanning lines are smooth and continuous.

SOUND IF ALIGNMENT

Restore the receiver to normal operation. Tune in a TV station and adjust the fine tuning until sound bars just appear in the picture. Adjust A9 fully counter clockwise. Then clockwise until the horizontal scanning lines are smooth and continuous. Readjust the fine tuning for clearest picture and best sound. Insert an attenuator in series with the antenna and the receiver antenna terminals so that the signal strength may be varied from weak to strong. If a suitable attenuator is not available, stray feed the signal to the receiver by placing the antenna lead-in near the receiving antenna terminals. Reduce the signal input to the receiver so that the signal falls below the limiting level of the 3BN6 (V8) as evidenced by a hiss in the sound. Adjust A10, A11, A12 and the buzz control (R6) for maximum clear sound and MINIMUM buzz. If the hiss disappears during alignment, increase attenuation until the hiss reappears.

OSCILLATOR ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point (C). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide usable pattern on scope.
The channel oscillator adjustment slugs are reached thru a hole in the front of the tuner as the channel switch is turned to each channel.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC	13	Vert. Amp. thru 47K to point (A). Low side to chassis.	A13	Adjust to place video marker at 50% as in Fig. 3.
			207MC (10MC Swp)	205.25MC	12		A14	
			201MC (10MC Swp)	199.25MC	11		A15	
			195MC (10MC Swp)	193.25MC	10		A16	
			189MC (10MC Swp)	187.25MC	9		A17	
			183MC (10MC Swp)	181.25MC	8		A18	
			177MC (10MC Swp)	175.25MC	7		A19	
			85MC (10MC Swp)	83.25MC	6		A20	
			79MC (10MC Swp)	77.25MC	5		A21	
			69MC (10MC Swp)	67.25MC	4		A22	
			63MC (10MC Swp)	61.25MC	3		A23	
			57MC (10MC Swp)	55.25MC	2		A24	

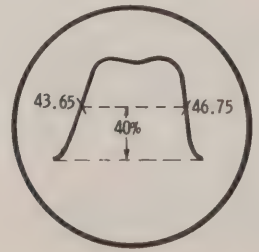


FIG. 1

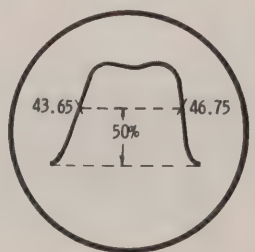


FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

RF AND MIXER ALIGNMENT FOR TUNER #211-27255

Connect bias as under "Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (B). Low side to chassis.	A25, A26	Adjust A25 and A26 for response similar to Fig. 4 with markers on shoulders of curve.
11.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 4. If markers fall below 70% on any channel, make compromise adjustment of A25, and A26 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			
12.	"	"	Not used	105.0MC	2	USE VTVM. DC probe to point (A). Common to chassis.	A27	Adjust for MINIMUM deflection.

RF AND MIXER ALIGNMENT FOR TUNER #211-27057

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10K to point (B). Low side to chassis.	A28, A29, A30	Adjust for response curve similar to Fig. 4 with markers above 90%.
14.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 4. If markers fall below 70% on any channel, make compromise adjustments of A28, A29 and A30 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

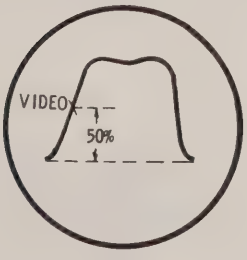


FIG. 3

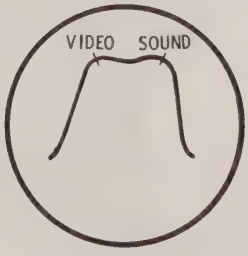


FIG. 4

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2BN4	0Ω	2Meg	9Ω	8Ω	†3700Ω	0Ω	2Meg		
V2	5CG8	10K	†9500Ω	0Ω	6Ω	8Ω	†3700Ω	†2700Ω	0Ω	224K
V3	3CB6	1Meg	47Ω	6Ω	5Ω	†3200Ω	†3200Ω	0Ω		
V4	3CB6	1Meg	47Ω	5Ω	4Ω	†3200Ω	†3200Ω	0Ω		
V5	5AN8	330K	2.6Meg	0Ω	4Ω	2.5Ω	†4300Ω	†4300Ω	.1Ω	82Ω
V6	12BY7A	• 270Ω	1Meg	•270Ω	13Ω	13Ω	14Ω	†4000Ω	†12K	•270Ω
V7	5AN8	†19K	30K	0Ω	11Ω	13Ω	†22K	†22K	1Meg	0Ω
V8	3BN6	•450Ω	.3Ω	0Ω	1Ω	†12K	5Ω	†220K		
V9	5AQ5	•50Ω	330Ω	15.5Ω	14Ω	†400Ω	†46Ω	• 50Ω		
V10	6CM7	‡5400Ω	TP	•170K	9Ω	11Ω	‡• 3.8Meg	47K	2.2Meg	• 1100Ω
V11	6CG7	†100K	340K	0Ω	15.5Ω	17Ω	†• 22K	1.4Meg	280K	0Ω
V12	25CD6GA	TP	17Ω	0Ω	NC	470K	NC	25Ω	†8300Ω	TOP CAP ‡ 5Ω
V13	19AU4	TP	NC	¶	TP	†46Ω	NC	25Ω	30Ω	
V14	1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ‡ 280Ω
V15	21ALP4B	1Ω	33K	PIN 6 †46Ω	PIN 10 ‡50K	PIN 11 •180K	PIN 12 2.5Ω			

NC NO CONNECTION
TP TIE POINT
† MEASURED FROM OUTPUT OF M2.
• THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
‡ MEASURED FROM PIN 3 OF V13.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMCVAL

1. Remove 7 push-on type control knobs from the front. NCTE: On power tuning models, DO NOT attempt to remove the on-off or channel selector buttons. On these models remove the 4 metal screws, the escutcheon, and remove the channel indicator disc and the fine tuning drive.

2. Lay receiver face down on a soft pad .

3. Remove 6 spring clips, 2 metal screws and the rear cover.

4. Remove speaker leads, picture tube socket, HV lead, yoke plug and 2 control plugs.

5. Remove 2 metal screws from the tuner bracket.

6. Remove 1 metal screw holding the top chassis brace.

7. Remove 4 metal screws holding the chassis.

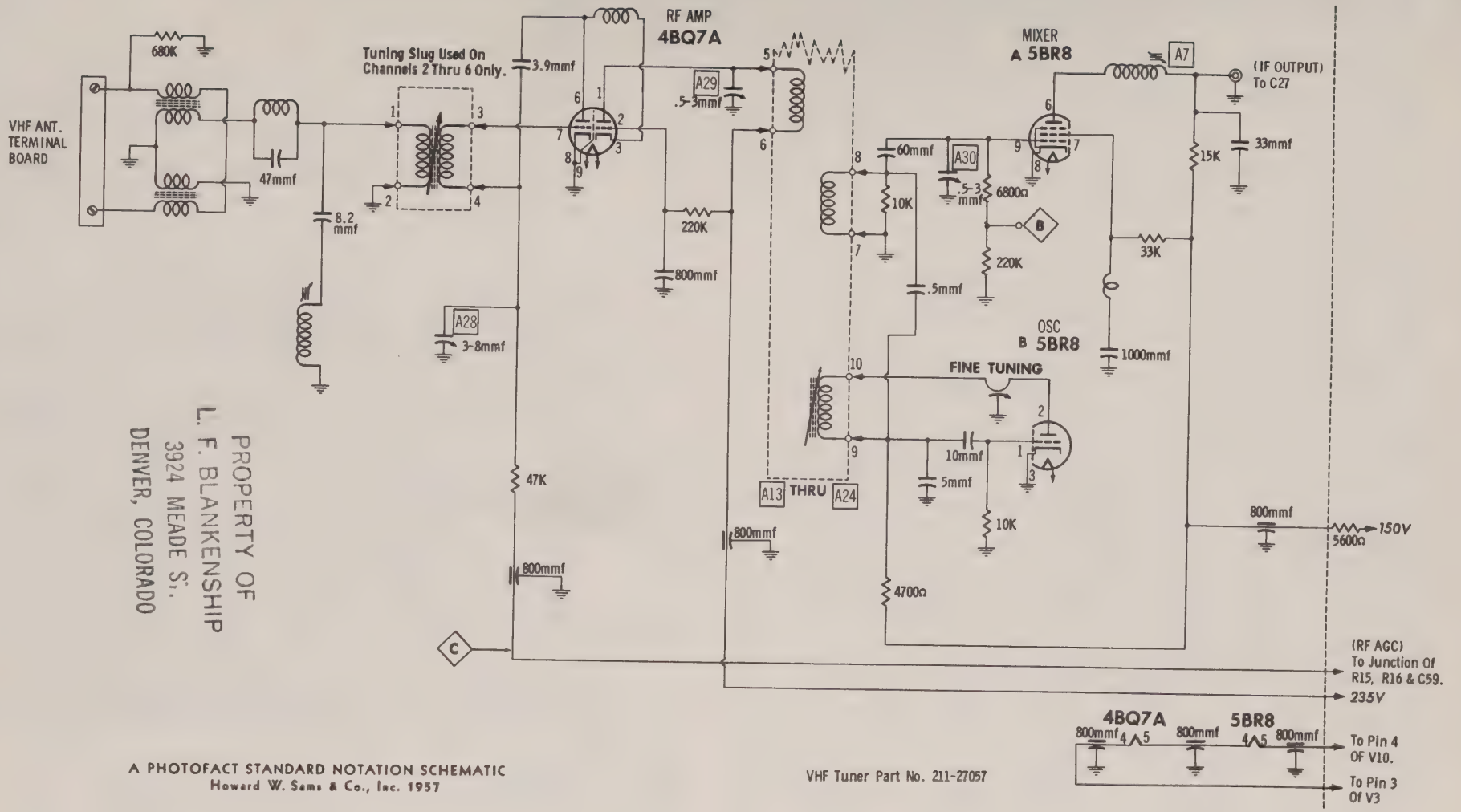
8. Remove the chassis.

9. Set the cabinet upright.

10. Remove 4 metal screws and the escutcheon from the front.

11. Remove the 4 metal screws holding the 2 control panels, and remove the panels.

12. Remove 2 speaker nuts and the speaker.



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

VHF Tuner Part No. 211-27057

ALTERNATE VHF TUNER SCHEMATIC

TRUETONE MODELS 2D1720A, B, 2D1721A, B, 2D1724A, B, 2D2726A, B, 2D2727A, B, 2D2728A, B

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	3BN4	
V2	Mixer-Oscillator	3CG4	
V3	1st Video IF Amp	3CB6	
V4	2nd Video IF Amp	3CB6	
V5	3rd Video IF Amp		
V6	Sync Separator	3AN8	
V7	Video Output	12BY7A	
V8	Sound IF Amp-Det-1st Amp	3AN8	

PICTURE TUBE

ITEM No	REPLACEMENT DATA			NOTES
	TRUETONE PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
T1	21ALP4B	21ALP4B 21ALP4 21ATP4A	21ALP4B 21ALP4B 2 21ALP4 21ALP4A 2 21ATP4 21ATP4A 2 21ATP4A 2	1 Aluminized 2 Silver screen "S5"
	24DP4A	24DP4A 1 24DP4	24DP4A 2 24DP4	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	TRUETONE PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	150	8C-37137	PRU-100	KA2S51	TC405	TD-150-150	MT-15150	TVA-1422
C2	50	300	8C-37118	AFHD-37-2S		TC406	TMS-43	3300	TVL-1594
C3A, C3B	100 100	300 300	8C-37088	PRS-103 —BR506 —DC025	—BR505	WQ-835		T-537 MT-0255	R2237 *
C4	8	300	8C-34764-1	PRS350V4	BR435	TC90	TD-8-350	FM-3508	TVA-1501
C5	20	25	8C-37130	PRS25V20	BR3035	TC95	TD-20-25	FM-2520	TVA-1505
C6	30	450	8C-37078	PRS450V30	BR3045	TC17	TD-30-450	FM-4530	TVA-1711

* Non-catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	140		13LBDBSIK	MPG-81 130	TCC-120	C10T15C	TCC-120		5TCC-T13	NP0
C8	30		13M-320EA30U- MI							
C9	28		13R-005							
C10	2		13R-001							
C11	1000		13M350EA102Z- 04	EF-001	MFT-1000		532-B		503C-D1	
C12	1.5 4.5				529-6		532-B			
C13	3.0 4.5		31B-902-07							
C14	5.5		13L5GP090M		529-5		532-B			N900
C15	47		13M20U470Z							
C16	1000		31T-B1M	EF-001	MFT-1000				503C-D1	
C17	1.0 4.5		31B-902-07		529-6		532-B			
C18	47		13R-098							
C19	30		13M-320EA300M- 2H							
C20	18		13L10C180U		TCZ-18	C10Q18C	TCC-18			NP0
C21	6.8		13R-006		TCZ-6S8	C10V68C	TCC-6.8	27-S568	5TCCB-V68	N750
C22	6.8		13R-007							N2200
C23	1000		10S8-27602	EF-001	MFT-1000				503C-D1	
C24	1000		10S8-27602	EF-001	MFT-1000				503C-D1	
C25	1000		10S8-27602	EF-001	MFT-1000				503C-D1	
C26	1000		10S8-27602	EF-001	MFT-1000				503C-D1	
C27	100			N750-S1 100	TCN-100	C10TU	TCT-100	NT-531	5TCU-T1	N750
C28	27				TCZ-27		TCZ-S27	UC-5427		
C29	10			NP0-S1 10	TCZ-10	C10QC	TCC-10	27-S541	5TCC-Q	NP0
C30	680			S1 680	D6-S81	BYA10T68D	RED-680	UC-5368	5GA-T68	
C31	10			NP0-S1 10	TCZ-10	C10QC	TCC-10	27-S41	5TCC-Q	NP0
C32	680			S1 680	D6-S81	BYA10T68D	RED-680	UC-5368	5GA-T68	
C33	5000			BPD-005	DD-501	BYA10D5	ED-005	DC525	5HK-D5	
C34	27				TCZ-27	L10Q27	ED-27	UC-5427		
C35	15			N750-S1 15	TCN-15	C10QS1U	TCT-15		5TCU-Q15	N750
C36	220			BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	①
C37	5000			BPD-005	DD-501	BYA10D5	ED-005	DC525	5HK-D5	
C38	5000			BPD-005	DD-501	BYA10D5	ED-005	DC525	5HK-D5	
C39	33			N750-S1 33	TCN-33	C10Q33U	TCT-33		5TCU-Q33	N750
C40	10			NP0-S1 10	TCZ-10	C10V5C	TCC-5	27-S55	5TCCB-Y47	NP0
C41	.1	300		P388N-1		DF-104	CUB2P1		GEM-301	JTM-P1
C42	.1			NPO-S1 60		TCZ-51	L40G1	ED-51		
C43	.1	400		P488N-1		DF-104	CUB4P1		GEM-401	4TM-P1
C44	.1			BPD-001	DD-101	L10T1	ED-100		GEM-S1	5GA-T1
C45	.047	600		BPD-05	DF-503	CUB6S47			GEM-S147	5TM-S47
C46	.068	600		P688N-S68		CUB6S68			GEM-S168	5TM-S68
C47	3.3			NP0-S1 3.3	TCZ-3S3	C10V33	TCC-3.3	27-S533	5TCCB-V33	
C48	47			BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5TCC-Q47	
C49	470			BPD-00047	DD-471	BYA10T47ED	470	UC-5347	5GA-T47	
C50	10000			BPD-0.	DD-103	BYA5D1	ED-01	DC511	5HK-S1	
C51	5000			NPO-S2 10	TCZ-10	C10QC	TCC-10	27-S41	5TCC-Q	NP0
C52	1000			BPD-001	DD-102	BYA5D1	ED-001	DC521	5HK-D1	
C53	10000			BPD-01	DD-103	BYA5S1	ED-01	DC511	5HK-S1	
C54	1000			BPD-001	DD-102	BYA5S1	ED-001	DC521	5HK-D1	
C55	.01	400		BPD-01	DD-103	CUB4S	ED-01	GEM-411	4TM-S1	
C56	.0047	500		BPD-0047	DD-472	CUB5D47	ED-0047	GEM-5247	5TM-D47	
C57	5000			BPD-005	DD-502	BYA5D5	ED-005	DC525	5HK-D5	
C58	33	300		P388N-33		CUB3P33		GEM-3033	3TM-P33	
C59	5000			BPD-005	DD-501	BYA10D5	ED-005	DC525	5HK-D5	
C60	1000			BPD-001	DD-102	BYA5D1	ED-001	DC521	5HK-D1	
C61	1000			BPD-001	DD-103	BYA5D1	ED-001	DC521	5HK-D1	
C62	680			S1 680	D6-S81	BYA10T68D	ED-680	UC-5368	5GA-T68	
C63	5000			BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	②
C64	220			BPD-00022	DD-221	L10T22	ED-220	UC-5322	4TM-S1	
C65	.01	400		BPD-01	DD-103	CUB4S	ED-01	GEM-411	4TM-S1	
C66	330			S1 330	D6-331	L10Y33	ED-330	UC-5333	5GA-T33	
C67	.047	300		BPD-05	DF-503	CUB3S47		GEM-3147	3TM-S47	
C68	.01	300		BPD-01	DD-103	CUB3S1	ED-001	DC523	5HK-D3	
C69	.033	400		BPD-03	DF-303	CUB4S33		GEM-4133	4TM-S33	
C70	.047	300		BPD-05	DF-503	CUB3S47		GEM-3147	3TM-S47	

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	TRUETONE PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C71	1	600		P188N-1	DF-104	CUB6P1		GEM-301	2TM-P1
C72	1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1
C73	1000	2000		HVD 30-4000	DD30 .02	HVB402		DC302	20GA-D4
C74	.01			S1 100	D6-101	L10T1	ED-.00	UC-551	5GA-T1
C75	47			BPD 000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47
C76	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47
C77	.047	300		BPD-05	DF 503	CUB3S47		GEM-3147	3TM-S47
C78	.022	200		BPD-02	DF-203	CUB2S22	ED-02	GEM-2122	2TM-S22
C79	47	400		P488N-47		CUB4P47		GEM-2047	2TM-P47
C80	470			BPD-00027	DD-471	L10T27	ED 270	UC-5327	5GA-T27
C81	.0			NPO-S1 0	TCZ-10	C10QC	TCC-10	27-S41	5TCC-Q NP0
C82	01	600		BPD-01	DD-103	CUD5S1	ED-01	GEM-651	6TM-S1
C83	1000			BPD-001	DD-102	BYA5D1	ED-001	DC521	5HK-D1
C84	82			S1 82	D6-820	L10Q82	ED-82	UC-5482	5GA-Q82
C85	82			S1 82	D6-82	L10Q82	ED-82	UC-5482	5GA-Q82
C86	1	600		P688N-1	DF-104	CUD6P1		GEM-601	6TM-P1
C87	470			S1 270	DD-271	L10T27	ED-270	UC-5327	5GA-T27
C88	0047	600		BPD-0047	DE-472	CUD5D47	ED-0047	GEM-5247	5TM-D47
C89	1	300		P388N-1	DF-104	CUB3P1		GEM-301	3TM-P1
C90	15	300		P388N-15		CUB3P15		GEM-3015	3TM-P15
C91	129	5000	6C-35325		DD30-S50	HVA30Q68		DC30456	30GA-Q68
C92	56	3000			BPD-03	DF-303	CUD6S43	GD-03	GEM-5123
C93	002	600		BPD-002	DD-202	BYA6D2	ED-001	DC521	5HK-D1
C94	1000			BPD-001	DD-102	BYA5D1	ED-001	DC521	5HK-D1
C95	1000			BPD-001	DD-102	BYA5D1	ED-001	DC521	5HK-D1
C96	1000			BPD-001	DD-103	BYA5D1	ED-001	DC521	5HK-D1
C97	22	400		P488N-22		CUD4P22		GEM-4022	4TM-P22
C98	330			BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33
C99	5000			BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5
C100	047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47
C101	.1	300		P388N-1	DF-104	CUB3P1		GEM-301	3TM-P1 ③

① Some versions may use a 560MMF in this application.
② Some versions may use a .1MFD 200V in this application.
③ Some versions may use a 68MMF ② 5KV (Part #47B696) in this application.
④ Some versions may use a 68MMF ② 3KV in this application.
5) Not used in some versions.

CONTROLS

ITEM No	RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	1	10A-28516	B-80	A47-1Meg-Z	Q31-157	U53	Volume - Note 1
B	Shaft			Not Req.	RSB-5	Not Req.	UB-26	
C	Switch			KB-1	BWE-12	T6-1	UB-26	
R2A	100M	1	10B-36828		A47-100Meg		U150	Picture - tap ② 750Ω
B	500K				Not Req.		Not Req.	Brightness
R3A	50K	1	10B-36826	F1-29	RTV-514		U2-979	Horiz. Hold
B	150K			RB-33	Not Req.		Not Req.	Vert. Hold
R4A	2500Ω	1	10B-37707	AS-7	A47-2500-S	Q11-111	U7	Vert. Linearity
B	Shaft			AK-1	FS5-1/4	QU1-163	Not Req.	
R5A	6Meg	1	10B-37708	AS-69		QU1-163		Vert. Size
B	Shaft			AK-1		Not Req.		
R6	750Ω	2	10D-32857-1		B9-500	Q11-140	FL-750	Buzz - wire wound
R7A	3Meg	1	10A-28667	B-84	A47-3Meg-Z	QU1-140	U58	Tuner AGC
B	Shaft			Not Req.	RSB-5	Not Req.	Not Req.	
C	Switch			KB-1	BWE-12	T6-1	UB-26	

Note 1. Alternate part #10B-36817

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R8	470Ω			BTS-4700	
R9	1000Ω			BTS-1000	
R10	3300Ω			BTS-3300	
R11	22K			BTS-220K	
R12	680Ω			BTS-6800	
R13	10K			BTS-1000	
R14	10K			BTS-103K	
R15	10K				
R16	1Meg				
R17	1000Ω				
R18	56000Ω				
R19	1000Ω			BTS-1000	
R20	47Ω			BTS-47	
R21	47K			BTS-47K	
R22	1000Ω				
R23	1000Ω			BTS-1000	
R24	47Ω			BTS-47	
R25	47K			BTS-47K	
R26	1000Ω			BTS-1000	
R27	82Ω			BTS-82	Note 1
R28	8200Ω				
R29	1Meg				
R30	3900Ω			BTS-3900	
R31	1Meg			BTS-1Meg	
R32	12K	1		BTA-12K	
R33	2000Ω 5%	2			
R34	2000Ω 5%	2			
R35	10K			BTS-10K	
R36	12K			BTS-120	
R37	3300Ω			BTS-3300	
R38	47Ω			BTS-47	
R39	1000Ω			BTS-1000	
R40	100K			BTS-100K	
R41	22K	1		BTA-220K	
R42	1Meg			BTS-1Meg	
R43	680Ω			BTS-680	
R44	12K	2		BTS-12K	
R45	220K			BTS-220K	
R46	330Ω	1		BTA-330	
R47	220K			BTS-220K	
R48	470K			BTS-470K	
R49	2.2Meg			BTS-2.2Meg	
R50	1.8Meg			BTS-1.5Meg	
R51	470K			BTS-470K	

ITEM No	RATING		REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	NOTES
	OHMS	WATT			
R52	33K			BTS-33K	
R53	330K	1		BTS-330K	
R54	15K			BTA-15K	
R55	3900Ω			BTS-3900	
R56	47K			BTS-47K	
R57	100K			BTS-100K	
R58	5.5Meg			BTS-3.3Meg	
R59	68K			BTS-68K	
R60	68000Ω			BTS-6800	
R61	2.2Meg			BTS-2.2Meg	
R62	4700Ω	7	9C12-1107		
R63	330K			BTS-330K	
R64	33K			BTS-33K	
R65	330Ω				
R66	330Ω				
R67	330K				
R68	330K				
R69	220K 5%			BTS-33K	
R70	10Meg			BTS-10M	
R71	33K			BTS-33K	
R72	3900Ω			BTS-3900	
R73	150K 5%			BTS-470K	Note 3
R74	8200Ω				
R75	10K			BTS-33K	
R76	10K			BTS-10K	
R77	15K			BTS-15K	
R78	100K			BTS-100K	
R79	100K	1		BTA-100K	
R80	33K			BTS-33K	
R81	120Ω			BTS-120	
R82	470K			BTS-470K	
R83	27000Ω	1		BTS-2700	Note 3
R84	56000Ω	7	9C1-1071		
R85	82K			BTS-82K	
R86	82K		9C12-1108	BTS-82K	
R87	5.7Ω 5%			BW1-5.7 5%	
R88	22K	1		BW1-22K	
R89	330K			BTS-330K	
R90	560Ω			BTS-560	
R91	25Ω	10	9C14-1117	PW10-25	
R92	4.7Ω 5%	13	9C15-1182		
R93	2200Ω	5			
R94	2700Ω	3	9C11-1104		
R95	3300Ω	5	9C13-1105	BW7-3300	

Note 1. Some versions may use a 150Ω in this application.
Note 2. Some versions may use a 120K in this application.
Note 3. In some versions R83 and R84 may be a single 9300Ω, 7W resistor.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA TRUETONE PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No.
T1	Horiz. Output Trans.	12E-27097	F8451 1 *6		A-3097 ②	32271 ②	V31S ②	V0-101 *4	25S52 ②
T2	Vert. Output Trans.	12E-37156	S1804 ②	A-3097 ②	32271 ②	V31S ②	V0-101 *4	25S52 ②	A-102K ②
T3A	Yoke(90°)Horiz. (18.5MH)	30L-37120 ②	DF907 ③	MDF-92 ③	28561 ③	T907U-62 ③	DY-18A ③	Y-16 ③	Y-41 & NW41
B	Vert.(38MH)	18M-28770 ③ 494-2714 ③							YC1 ④ CL2 ④

① Use original variable gap pressure spring.
② Drill new mounting hole(s).
③ Includes rear cover and centering device.
④ Rear cover and centering device
⑤ Yoke clamp.
⑥ Use original yoke damping network.
⑦ Use original rear cover and centering device.
* This part may be superceded by Parts Manufacturer's interchange part number.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8	8	8	8	8	8	8	8
4	2	2	2	2	2	2	2
1	1	1	1	1	1	1	1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	7700Ω	3-4Ω	12C-25704-2	Z1115 1	A-2931 1	A-8114 1	24S54 1	S-8X 1	1 Drill one new mounting hole.

SPEAKER

ITEM No.	TYPE	SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA TRUETONE PART No.	QUAM PART No	NOTES
SP1	8" PM	8"	PM	3-4Ω	18A-27438 ①	8A2L	① Used in Models 2DT72A, B
	5" PM	5"	PM	3-4Ω	18A-25925 ②	8A07	② Used in Models 2DT720A, B, 2DS72A, B
	5 1/4" PM	5 1/4"	PM	3-4Ω	18A-27229 ③		③ Two used in Models 2DT720A, B, 2DS72A, B

COILS (RF-IF)

ITEM No.	USE	TRUETONE PART No.	NOTES
L1	Ant. Trans.	10S8-27617	
L2	Parallel Trap	10S8-27615	
L3	Series Trap	10S8-27613	
L4A	Ant. RF, Mixer Grid, Osc. Coils	10S8-27614-2	Channel 3
B	Ant. RF, Mixer Grid, Osc. Coils	10S8-27614-3	Channel 5
C	Ant., RF, Mixer Grid, Osc. Coils	10S8-27614-4	Channel 4
D	Ant., RF, Mixer Grid, Osc. Coils	10S8-27614-5	Channel 5
E	Ant., RF, Mixer Grid, Osc. Coils	10S8-27614-6	Channel 8
F	Ant., RF, Mixer Grid, Osc. Coils	10S8-27614-7	Channel 7
G	Ant., RF, Mixer Grid, Osc. Coils	10S8-27614-8	Channel 8
H	Ant., RF, Mixer Grid, Osc. Coils	10S8-27614-9	Channel 9
I	Ant., RF, Mixer Grid, Osc. Coils	10S8-27614-10	Channel 10
J	Ant., RF, Mixer Grid, Osc. Coils	10S8-27614-11	Channel 11
K	Ant., RF, Mixer Grid, Osc. Coils	10S8-27614-12	Channel 12
L	Ant., RF, Mixer Grid, Osc. Coils	10S8-27614-13	Channel 13
L5	RF Choke	10S8-27615	
L6	Mixer Plate Coil	10S8-27615	

ITEM No.	USE	REPLACEMENT DATA TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L7	1st. Video IF	13A-26998				Includes 42.25MC Trap
L8	2nd. Video IF	13A-26994			6504	1.4 Microhenries
L9	3rd. Video IF	13A-26995	19-1001			Includes 4% 32MC Trap
L10	Resonant Choke	13A-26987				8 Microhenries, 3MC
L11	Resonant Choke	13A-26986				3 Microhenries - 88MC
L13	Shunt Peaking Coil	16A-27303	19-3360	TV-186	6181	280 Microhenries
L14	Series Peaking Coil	16A-27457			6196	640 Microhenries
L15A	4.5MC Trap	13M-26979				
B	1st Sound IF	13A-27488			6172	80 Microhenries
L17	4.5MC Trap	16A-26991		TV-181		
L18	2nd. Sound IF	201-25873-1				
L19	Quadrature Coil	13M-26988		TV-184		
L20	Resonant Choke	13A-26987				8 Microhenries, 3MC
L21	RF Choke	13A-26520	19-1004		6610	6 Microhenries
L22	RF Choke	13A-26520	19-1004		6610	6 Microhenries
L23	RF Choke	13A-26520	19-1004		6610	6 Microhenries
L24	Line Choke	13M-27404				47 Microhenries
L25	Line Choke	13M-27405				4 Microhenries

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No	Thordarson PART No	NOTES
L26	85Ω		13E-26993							Tapped @ 60Ω
L27	37Ω		13M-26992							Horiz. Freq. Sync. Winding

TRUETONE MODELS 2DT720A, B, 2DT721A, B, 2DT724A, B, 2DT720A, B, 2S727A, B, 2DS728A, B

FOLDER 5

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 ~	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L28	.300A	46Ω	1.5 HY	16B-25146-3	C5037 ①	C-2996 ①	C-2326 ①	26C44	C-17X ①

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA
K1	Ant. Input	470MMF, 1Meg		
K2	Ant. Input	470MMF, 1Meg		
K3	Vert. Integrator	2000MMF, 5000MMF, 5000MMF, 22K, 8200Ω, 8200Ω	17A-27087	Aerovox PA-110 Centralab PC-100 Cornell-Dubilier 115TM1 Erie 1405-01 Sprague V-1

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT (Measured)	TRUETONE PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.335A	21J25315 ①	1241A ①	1N1007 ②	MR350 ①	6S450 ①	350A ①	
M2	.335A	21J25315 ①	1241A ①	1N1007 ②	MR350 ①	6S450 ①	350A ①	

① Selenium Type. ② Germanium type.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		TRUETONE PART No.	SYLVANIA PART No.	
M3	1N295 *		1N60	Video Detector (Pigtail)

* A CK706A may be used in some versions.

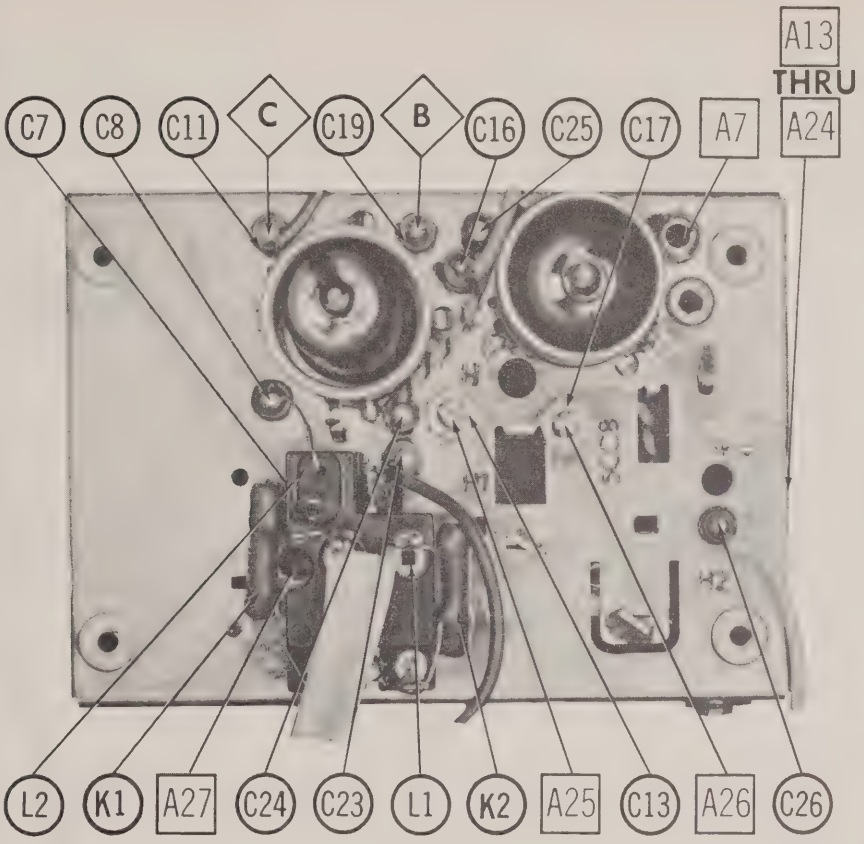
MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Tuner	211-27255	VHF Neutrode
	Tuner	211-27057	VHF Cascode
M5	Video Det. Assy.	13B-27003	Includes 4th. Video IF, Caps., RF Choke & Coils
M6	Centering Device	16M-23770	
M7	Ion Trap	16M-19705	
M8	Magnet	201-26614	Anti-pin cushion (2 used)
M9	Yoke Clamp	49M-27154	
M10	Circuit Breaker	20F-27084	
	Motor	21M-26633	Power Tuning
	Switch	20M-26634	Snap Action
	Index Plate	200-26684	Assembly, Power Tuning
	Power Tuning	200-26687	Complete Assembly

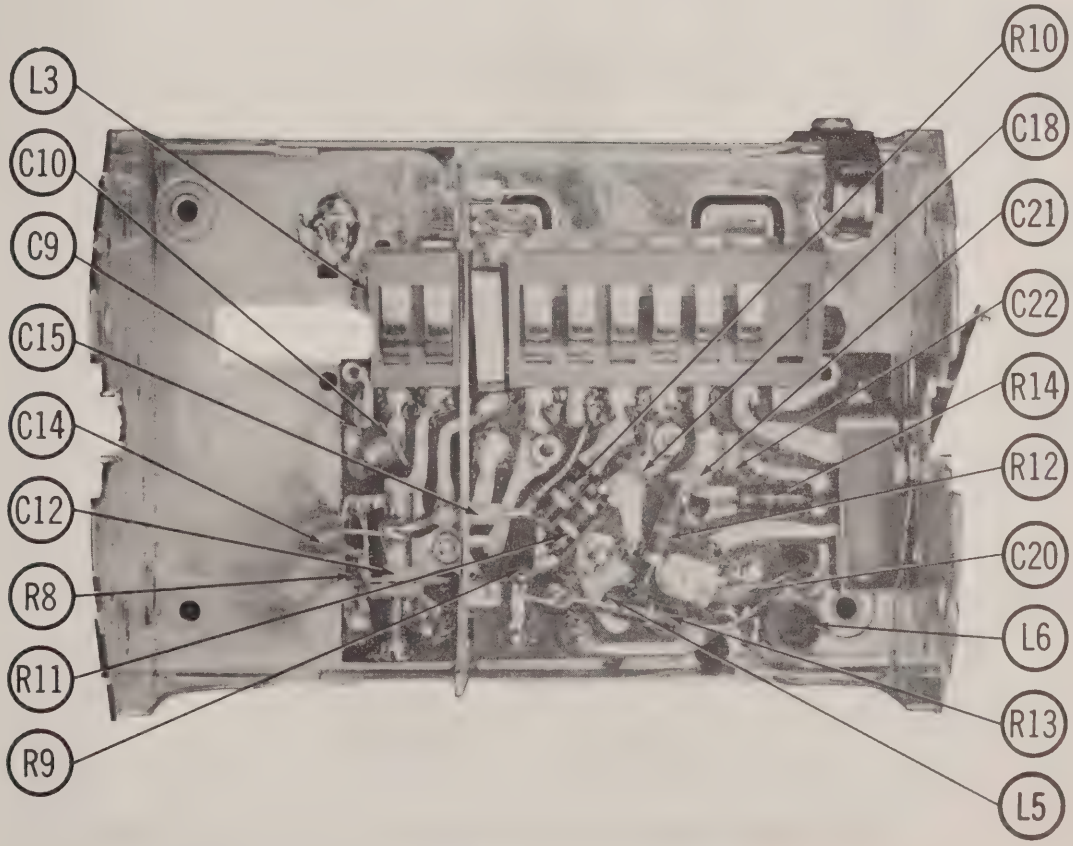
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

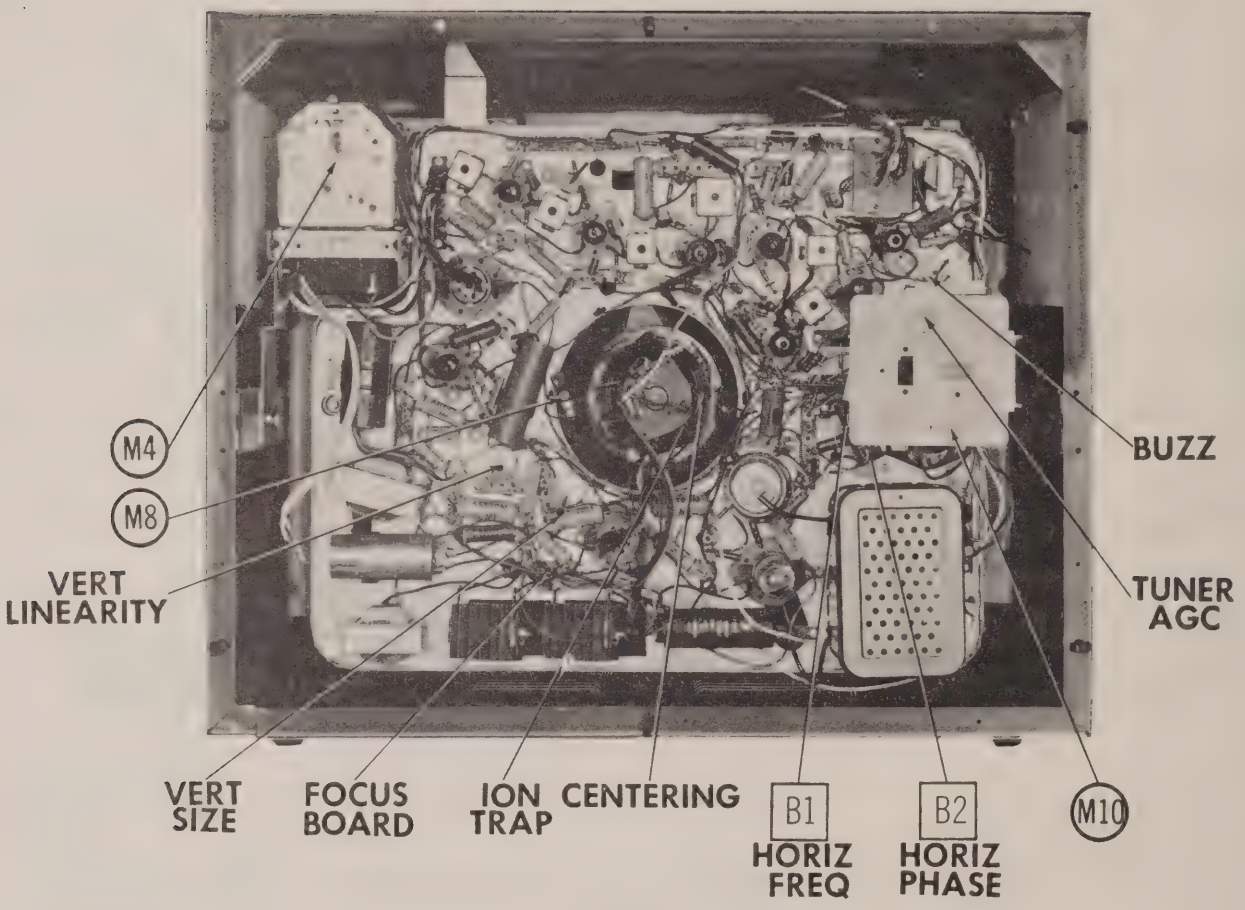
NAME	PART NO.	DESCRIPTION
Safety Glass	30M-27116	Models 2D1720A, B, 2D1721A, B
Safety Glass	30M-26963	Models 2D1726A, B, 2D1727A, B
Cabinet	24D-26968	Models 2D1720A, B
Cabinet	24D-27013	Models 2D1721A, B
Cabinet	24D-27009	Models 2D1724A, B
Cabinet	200-27115	Models 2D2726A, B
Cabinet	200-27115-1	Models 2D2727A, B
Indicator Disc	5M-26873	Models 2D1720A, 2D1721A
Indicator Disc	83B585	Models 2D1720B, 2D1721B, 2D1724B
Indicator Screen	6B-27016-A195	Models 2D1720B, 2D1721B, 2D1724B
Button	5A-26854-A195	On-off - Models 2D1720A, B, 2D1721A, B, 2D1724A, B
Button	5A-26855-A195	Tuner - Models 2D1720A, B, 2D1721A, B, 2D1724A, B
Knob	5B-27547-A195	Volume - Models 2D1720A, B, 2D1721A, B, 2D1724A, B
Knob	5B-27007-A195	Volume - Models 2D1724A, B
Knob	5B-26392-A29	Fine Tuning - Models 2D2726A, B, 2D2727A, B
Knob	5B-27548-A195	Fine Tuning - Models 2D1720A, B, 2D1721A, B
Knob	5B-27542-A195	Picture
Knob	5B-26395-A195	Channel Selector - Models 2D2726A, B, 2D2727A, B
Knob	5B-27545-A195	Brightness
Knob	5B-27543-A195	Horiz. Hold
Knob	5B-27544-A195	Vert. Hold
Knob	5B-26872-A195	Vert. Hold - Model 2D1724B
Knob	5B-27005-A195	Brightness - Model 2D1724B
Knob	5B-27006-A195	Horiz. Hold - Model 2D1724B
Knob	5B-26870-A195	Fine Tuning - Model 2D1724B
Knob	5B-26871-A195	Picture - Model 2D1724B



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the horizontal hold control (R3A) to the center of its range.

Connect a short clip lead across L27. Adjust the horizontal frequency coil slug (B1) until the picture synchronizes horizontally. Remove the clip lead from L27. Connect the vertical amplifier of the oscilloscope to point Ⓓ. Low side to chassis. Adjust the horizontal waveform slug (B2) until a waveform similar to Fig. 5 is obtained with round and sharp peaks of equal amplitudes. While making this adjustment, keep the picture in sync with the horizontal hold control. Remove the scope connection and check the range of the horizontal hold control. The picture should fall out of sync at both extreme settings of the horizontal hold control.

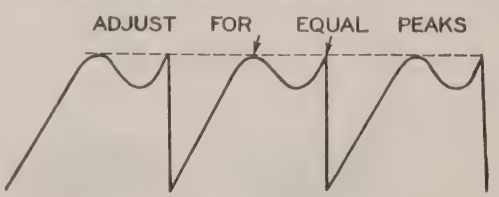


FIG. 5

PHOTOFACT* Folder

*TRADE MARK

ADMIRAL MODELS 7L12, 7L14, 7L16, 7L18 (Ch. 7L1)

ADMIRAL MODELS 7L12, 7L14, 7L16, 7L18 (Ch. 7L1)

MODEL 7L16

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ADMIRAL MODELS 7L12, 7L14, 7L16, 7L18 (Ch. 7L1)

TRADE NAME	Admiral Models 7L12, 7L14, 7L16, 7L18 (Ch. 7L1)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC
RATING	7.5MA @ 9 Volts DC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4, A5	Disconnect L2 (455KC Trap). Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat step 1 until no further increase is noted.
2.		"	"	"	"	A6	Reconnect L2. Adjust for MINIMUM output.
3.		"	1620KC	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1400KC	Tune to 1400KC signal	"	A8	Fahion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang.
	The following steps are not necessary unless it is impossible to tune in 535KC. Preset oscillator trimmer (A7) 1/4 turn from tight position. Proceed with step 5.						
5.		Loop	535KC	Tuning gang fully closed	Across voice coil	A9	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
6.		"	1620KC	Tuning gang fully open	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat step 5 & 6 until oscillator covers range required. Step 6 should be the last adjustment.
7.		"	1400KC	Tune to 1400KC signal	"	A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N172	Converter				
X2	2N146	1st. IF Amplifier				Alternate Type 2N147
X3	2N146	2nd. IF Amplifier				Alternate Type 2N145
X4	310	Driver		2N132		
X5	2N185	Output		2N131		Alternate Type 352
X6	2N185	Output		2N131		Alternate Type 352

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	3	67B32-5	XPP3V50	NL50-3	TT6X50	ML50-3		TE-1100
C2	10	10	67B32-7	XPP10V10	NL10-10	TT12X10	ML10-15		TE-1114
C3	100	10	67B32-2	PWE10V100	NL100-10	TT10X100			R2418 *
C4	100	10	67B32-2	PWE10V100	NL100-10	TT10X100			R2418 *
C5	100	10	67B32-2	PWE10V100	NL100-10	TT10X100			R2418 *

* Non Catalog Item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	50000		65D10-116	BPD-05					5HK-S5	
C7	250			1469-00025		22R5T25			MS-325	
C8	10000		65D10-3	BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C9	8.2		65C6-117	NP0-SI 8.2	TCZ-8R2	CTA6V82C	TCO-8.2		5TCCB-V82	
C10	50000		65D10-116	BPD-05					5HK-S5	
C11	10		65C6-33	SI 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C12	50000		65D10-116	BPD-05					5HK-S5	
C13	50000		65D10-116	BPD-05					5HK-S5	
C14	50000		65D10-116	BPD-05					5HK-S5	
C15	10		65C6-33	SI 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C16	50000		65D10-116	BPD-05					5HK-S5	
C17	50000		65D10-116	BPD-05					5HK-S5	
C18	8.2		65C6-117	NP0-SI 8.2	TCZ-8R2	CTA6V82C	TCO-8.2		5TCCB-V82	
C19	4700		65D10-71	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5GA-D57	
C20	50000		65D10-116	BPD-05					5HK-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2500Ω	½	75C25-5					Volume & Switch

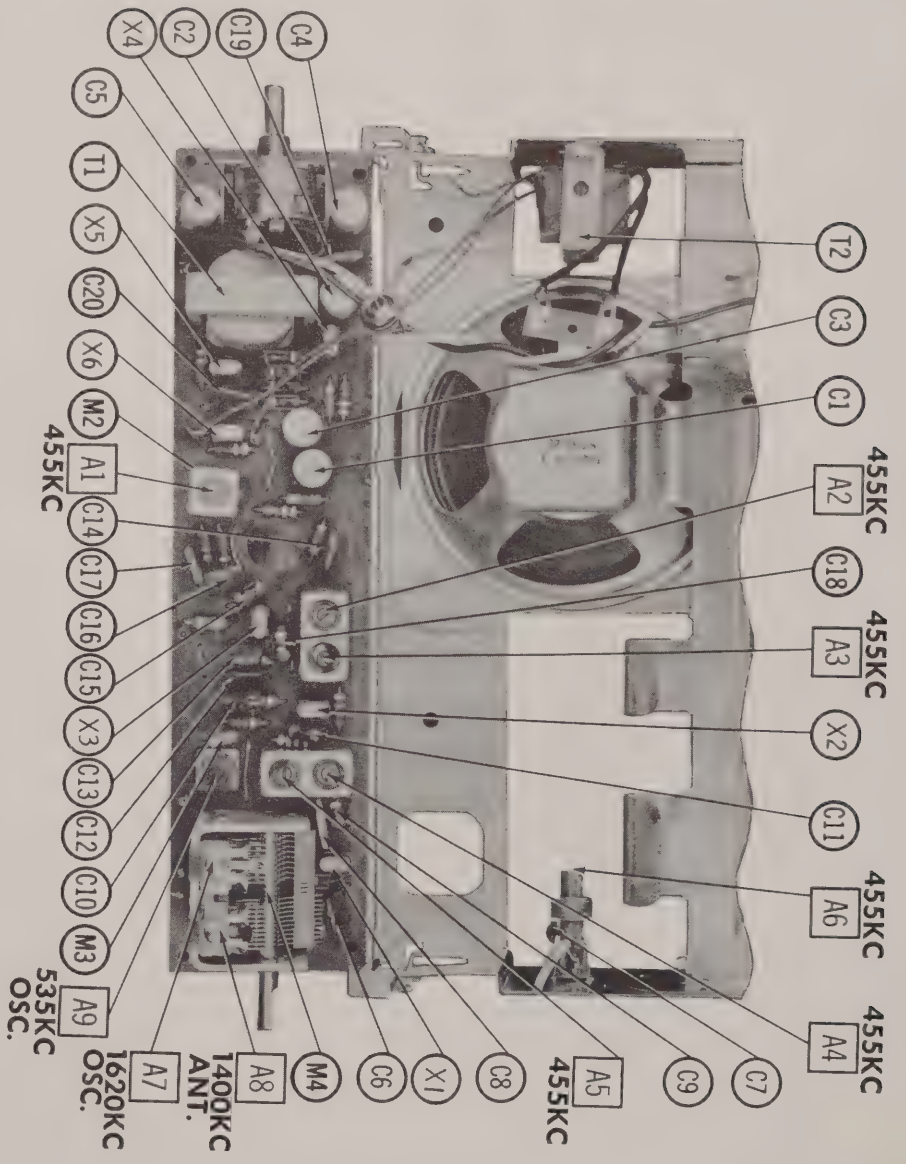
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ADMIRAL PART No.	IRC PART No.	
R2	150K		60B8-154	BTS-150K	
R3	1500Ω		60B8-152	BTS-1500	
R4	560Ω		60B8-561	BTS-560	
R5	47K 5%		60B8-473	BTS-47K 5%	
R6	1100Ω 5%		60B8-112	BTS-1100 5%	
R7	470Ω		60B8-471	BTS-470	
R8	3300Ω		60B8-332	BTS-3300	
R9	1500Ω		60B8-152	BTS-1500	
R10	2200Ω		60B8-222	BTS-2200	
R11	15K		60B8-153	BTS-15K	
R12	1100Ω 5%		60B8-112	BTS-1100 5%	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ADMIRAL PART No.	IRC PART No.	
R13	220Ω		60B8-221	BTS-220	
R14	470Ω		60B8-471	BTS-470	
R15	2200Ω		60B8-222	BTS-2200	
R16	15K		60B8-153	BTS-15K	
R17	1000Ω		60B8-102	BTS-1000	
R18	47Ω		60B8-470	BTS-47	
R19	15K		60B8-153	BTS-15K	
R20	15K		60B8-153	BTS-15K	
R21	10Ω		60B8-100	BTS-10	
R22	10Ω		60B8-100	BTS-10	
R23	220Ω		60B8-221	BTS-220	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5:	1	79B67-1	TR-7 ①		TA-5 ①	TR-7 ①	TY-56X①	① Fabricate mounting.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	675Ω CT	3-4Ω	79B68-1	GH6 ①			TR-29 ①	TY-44X ①	① Drill new mounting hole(s).

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	78B121-1 ①	4A07	① Includes T2

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	69B214-1				
L2	IF Trap	69B216-1				Includes C7
L3	Osc. Coil	69B213-1				
L4	1st. IF	72C174-2				
L5	2nd. IF	72C174-2				
L6	3rd. IF	72C174-1				Includes M2

BATTERIES

ITEM No.	VOLTAGE	ADMIRAL PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V		2R		950		M-13		2LP		Connect six in series

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ADMIRAL PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N295		1N60	1N60	Audio Det. (Part of L6)
M3	1N295		1N60	1N60	Limiter

MISCELLANEOUS

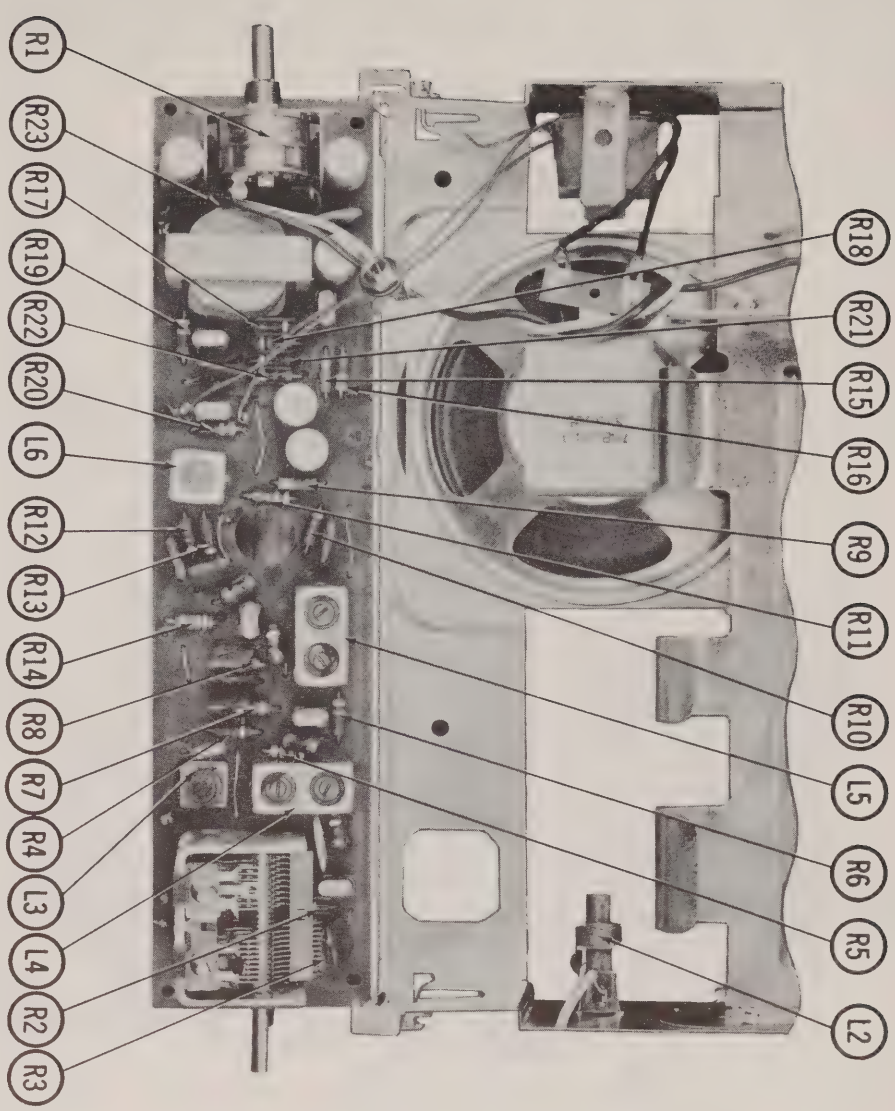
ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Tuning Cap.	68B66-1	2 Gang (Ant. 22-300MMF)

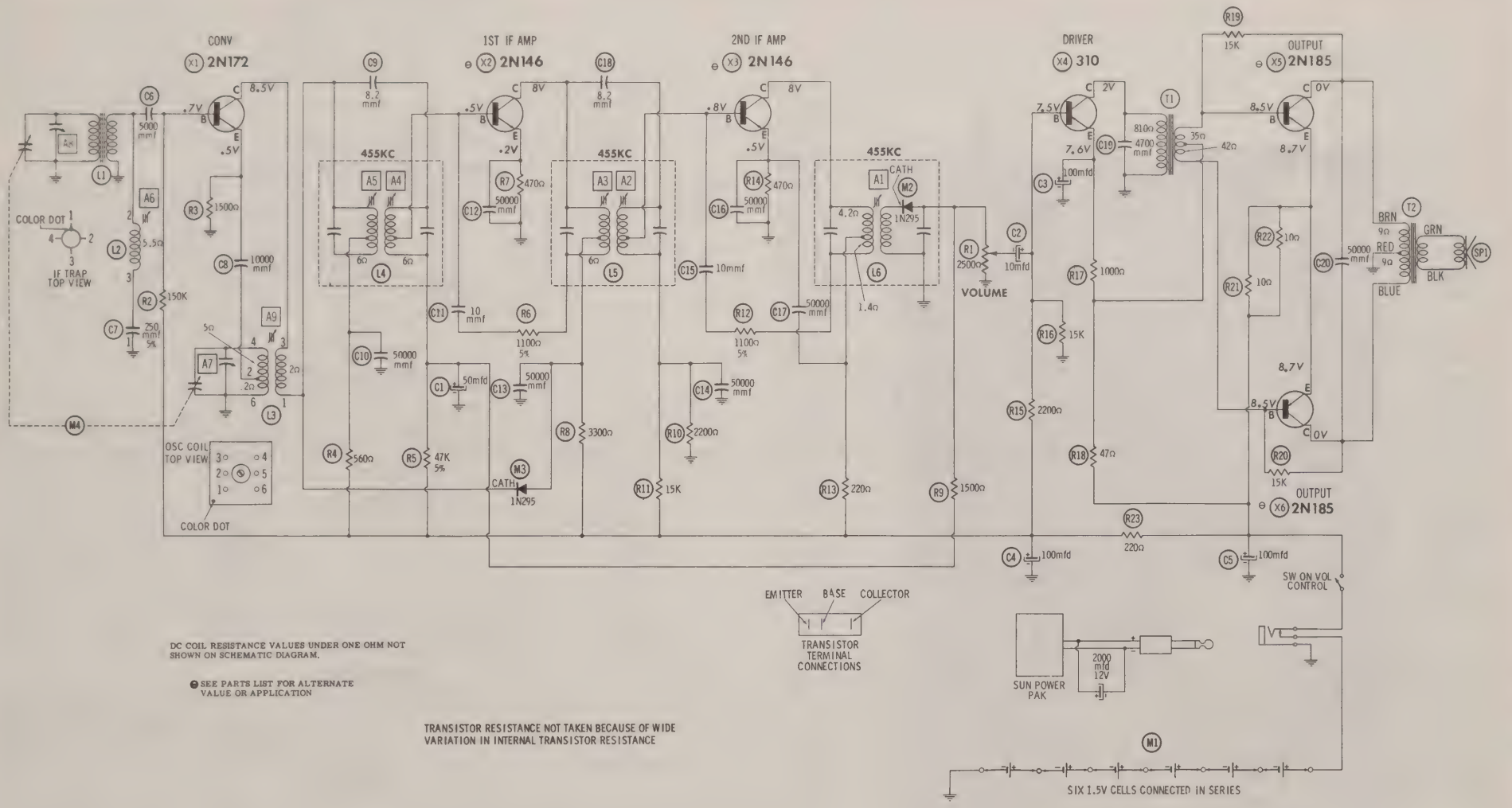
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Printed Panel	14E186	
Knob	33C183-4	Tuning, Red, Model 7L12
Knob	33C183-6	Tuning, Tan, Model 7L14
Knob	33C183-12	Tuning, Yellow, Model 7L16
Knob	33C183-8	Tuning, Turquoise, Model 7L18
Knob	33C183-3	On-Off-Volume, Red, Model 7L12
Knob	33C183-5	On-Off-Volume, Tan, Model 7L14
Knob	33C183-11	On-Off-Volume, Yellow, Model 7L16
Knob	33C183-7	On-Off-Volume, Turquoise, Model 7L18

CHASSIS— TOP VIEW





DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

TRANSISTOR RESISTANCE NOT TAKEN BECAUSE OF WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PHOTOFACT* Folder

*TRADE MARK

BRAUN MODEL MM3

BRAUN MODEL MM3

BRAUN MODEL MM3

TRADE NAME	Braun Model MM3
SUPPLIER	Electronic Utilities Corp., 153 W. Huron St., Chicago 10, Illinois
TYPE SET	AC Operated FM-AM-SW Receiver
TUBES (Seven)	Types ECC85/6AQ8 FM RF Amp.-FM Conv., EF89/6AD6 1st FM IF Amp., ECH81/6AJ8 2nd FM IF Amp.-AM Mixer-AM Osc., EF89/6AD8 3rd FM IF Amp. - 1st AM IF Amp., EABC80/6T8 Ratio Det.-AM Det.-AVC-AF Amp., EM80/6BR5 Tuning Ind., EL84/6BQ5 Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .53 Amp. @ 117 Volts AC (55 Watts)

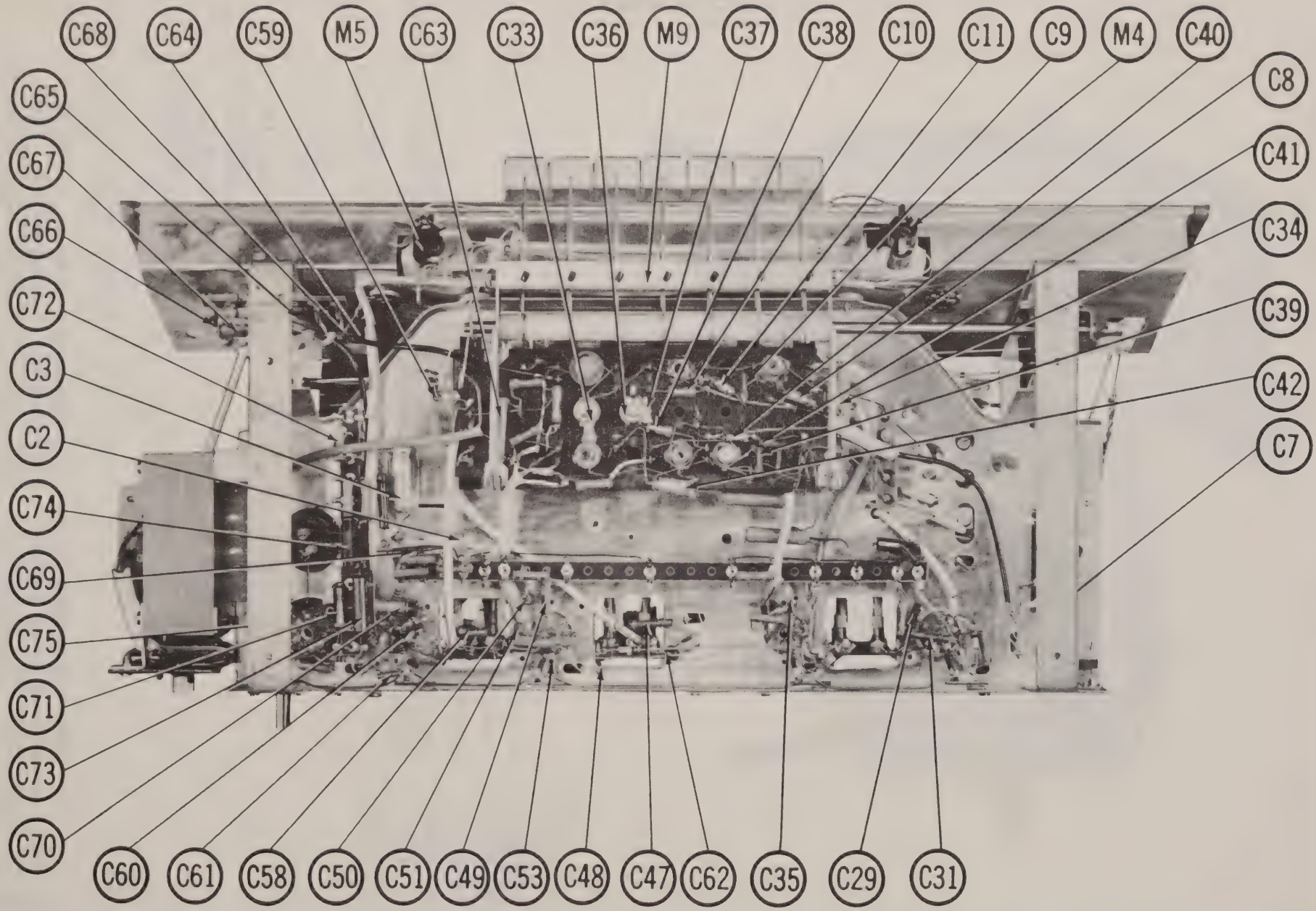
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

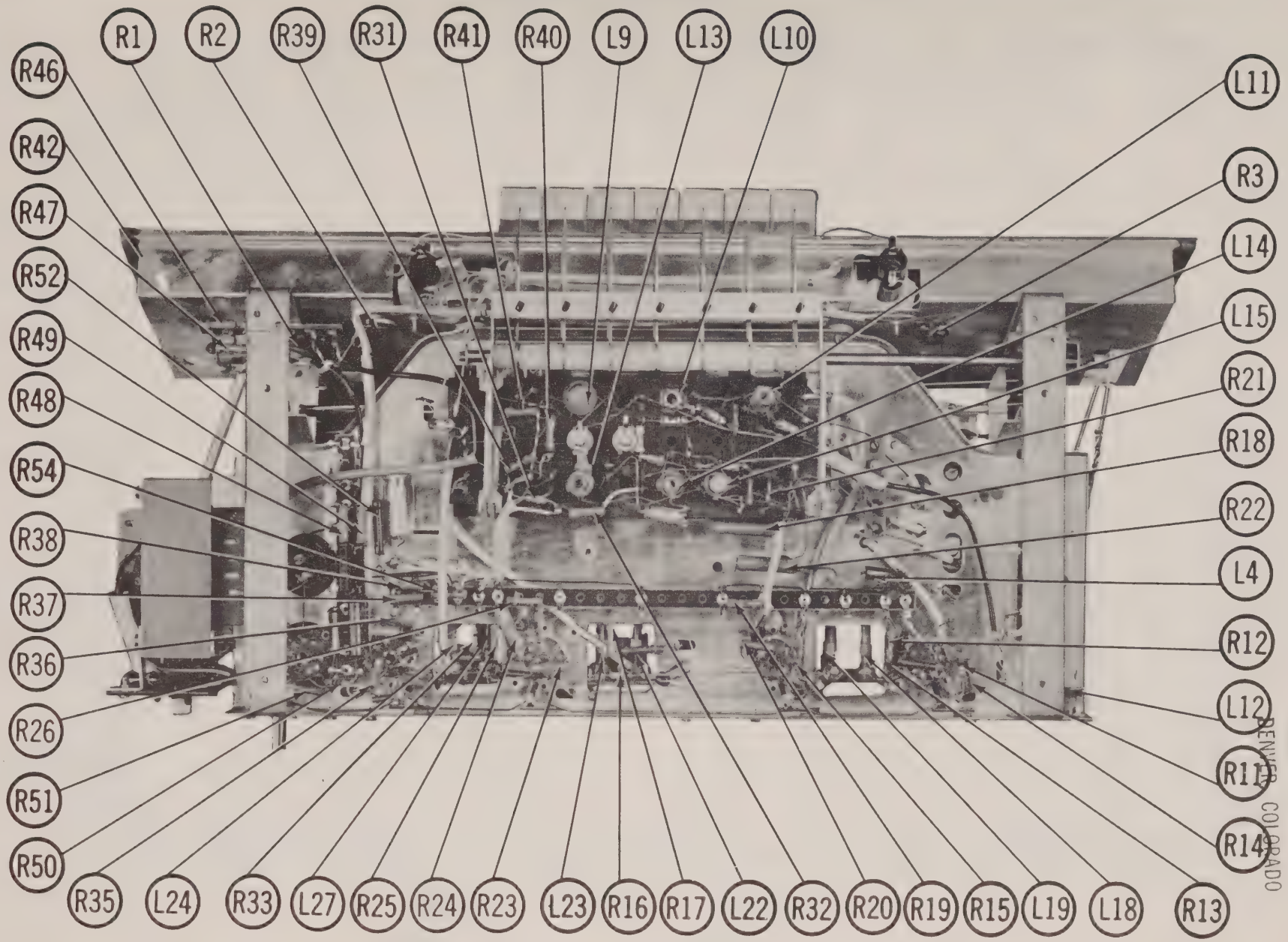
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

H127

FOLDER 7



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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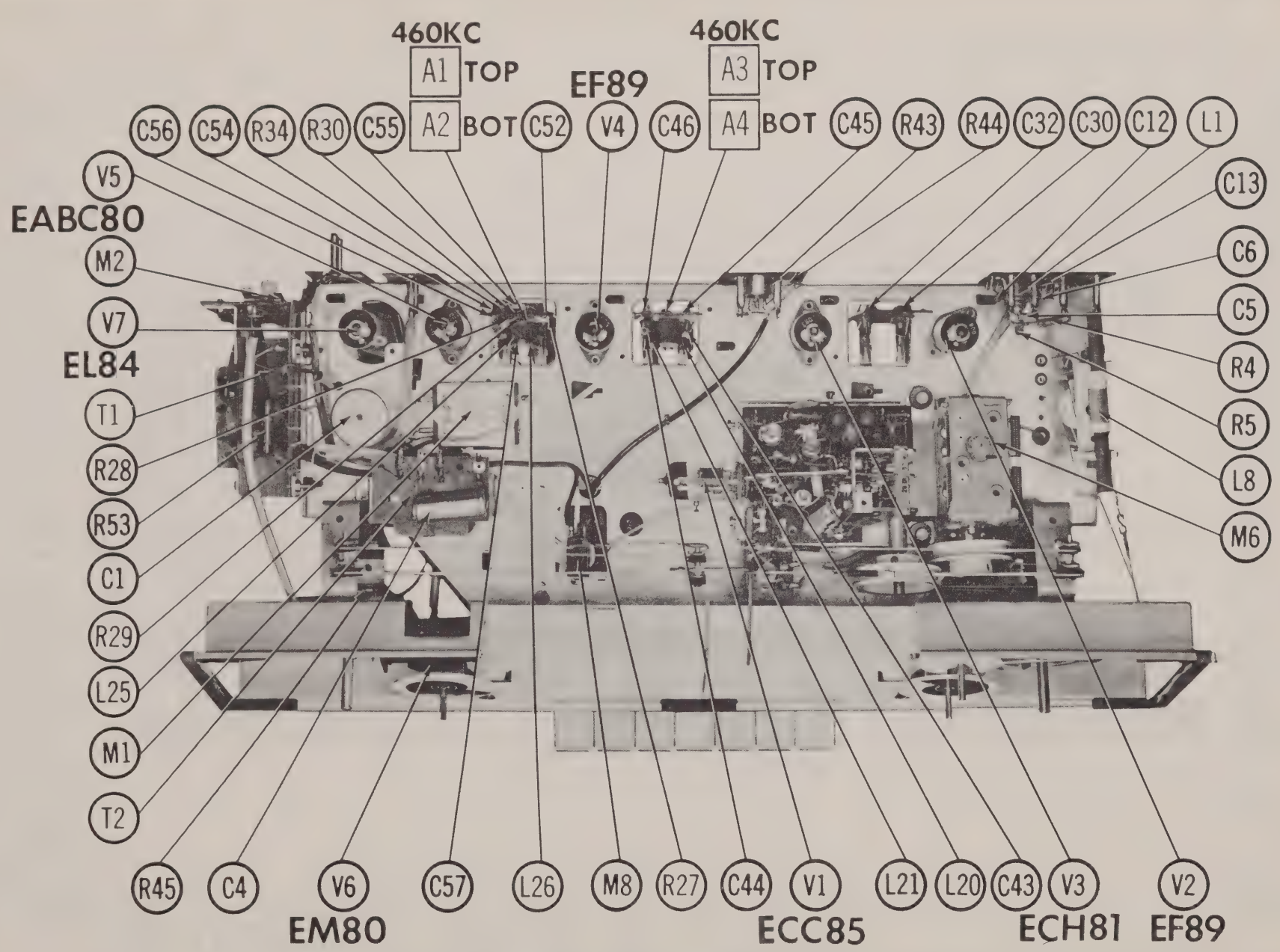
DENVER COLORADO



CHASSIS TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 2 (grid) of ECH81 (V3). Low side to chassis.	460KC (400~ Mod.)	AM	Tuning gang fully open.	Across voice coil	A1, A2, A3, A4	"Noise Suppressor" button depressed. Adjust for maximum output.
2.	"	"	1600KC	"	1600KC	"	A5	"
3.	"	"	600KC	"	600KC	"	A6	"
4.	"	"	1400KC	"	1400KC	"	A7, A8	"Noise Suppressor" button depressed. Adjust for maximum output. Repeat steps 2, 3, 4.

SHORT WAVE RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
5.	200MMF	High side to AM antenna terminal. Low side to chassis.	23MC	SWI	23MC	Across voice coil.	A9	"Noise Suppressor" button depressed. Adjust for maximum output.
6.	"	"	22MC	"	22MC	"	A10	"
7.	"	"	12.5MC	SWII	12.5MC	"	A11	"
8.	"	"	12MC	"	12MC	"	A12	"Noise Suppressor" button depressed. Adjust for maximum output. Repeat steps 5, 6, 7, 8.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (± 1%) resistors in series from point Ⓑ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	200MMF	High side to pin 2 (grid) of EF89 (V4). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference.	DC Probe to point Ⓐ. Common to chassis.	A13	Adjust for maximum deflection.
10.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
11.	"	High side to pin 2 (grid) of EF89 (V2). Low side to chassis.	"		"	DC probe to point Ⓐ. Common to chassis.	A15, A16, A17, A18	Adjust for maximum deflection.
12.	Direct	High side to ungrounded tube shield on ECC85 (V1). Low side to chassis.	"	"	"	"	A19, A20	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
9.	200MMF	High side to pin 2 (grid) of EF89 (V4). Low side to chassis.	10.7MC	FM	Point of non interference.	Vert. amplifier to point Ⓐ. Low side to chassis.	A13	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
10.	"	"	"	"	"	Vert. amplifier to point Ⓑ. Low side to chassis.	A14	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.
11.	"	High side to pin 2 of (grid) of EF89 (V2). Low side to chassis.	"	"	"	Vert. amplifier to point Ⓐ. Low side to chassis.	A15, A16 A17, A18	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
12.	Direct	High side to ungrounded tube shield on ECC85 (V1). Low side to chassis.	"	"	"	"	A19, A20	"

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
13.	270Ω resistor	Across FM antenna terminals.	90MC	FM	90MC	DC probe to point Ⓐ. Common to chassis.	A21, A22	Adjust for maximum output.
14.	"	"	105MC	"	105MC	"	A24	Adjust for maximum output. Repeat steps 13 & 14 until no further improvement can be obtained.
15.	"	"	"	"	"	"	A23	Adjust for MINIMUM output.

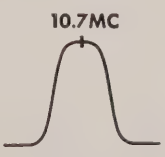


FIG. 1

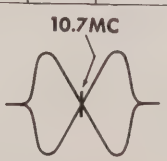
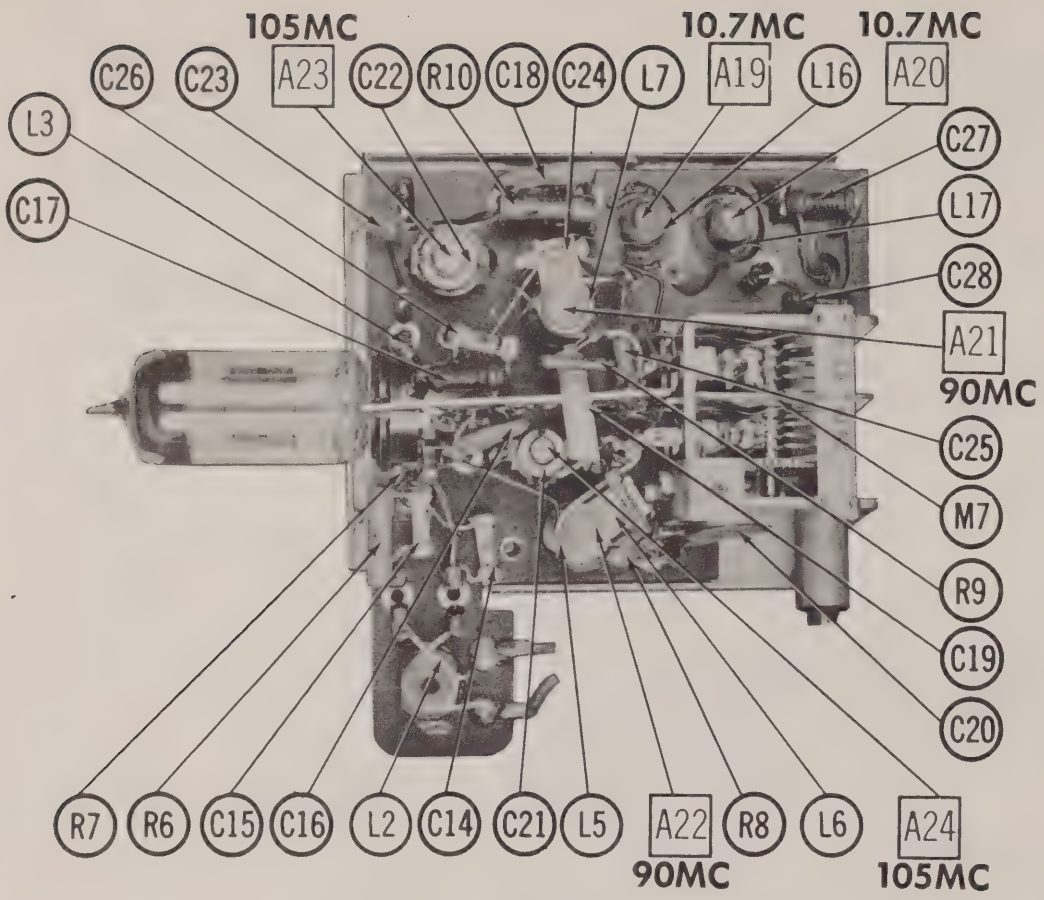
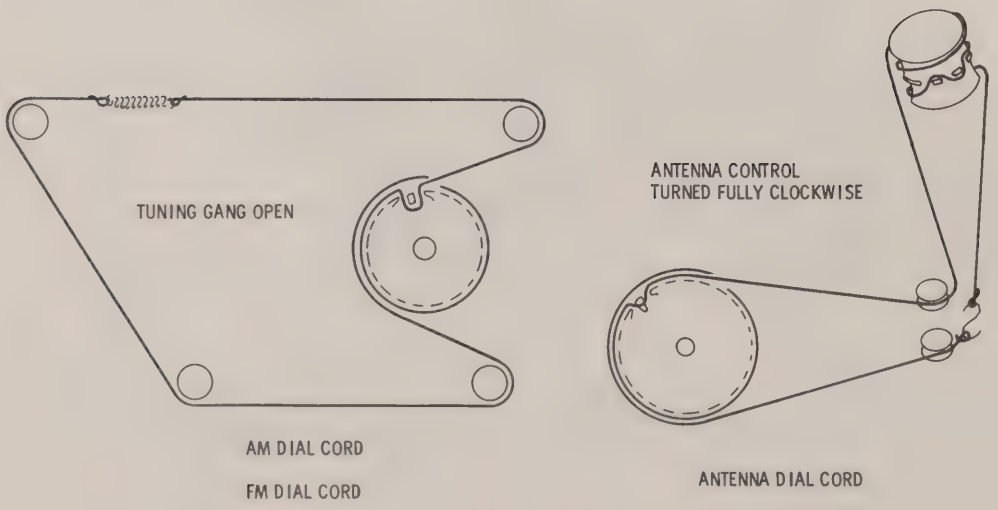


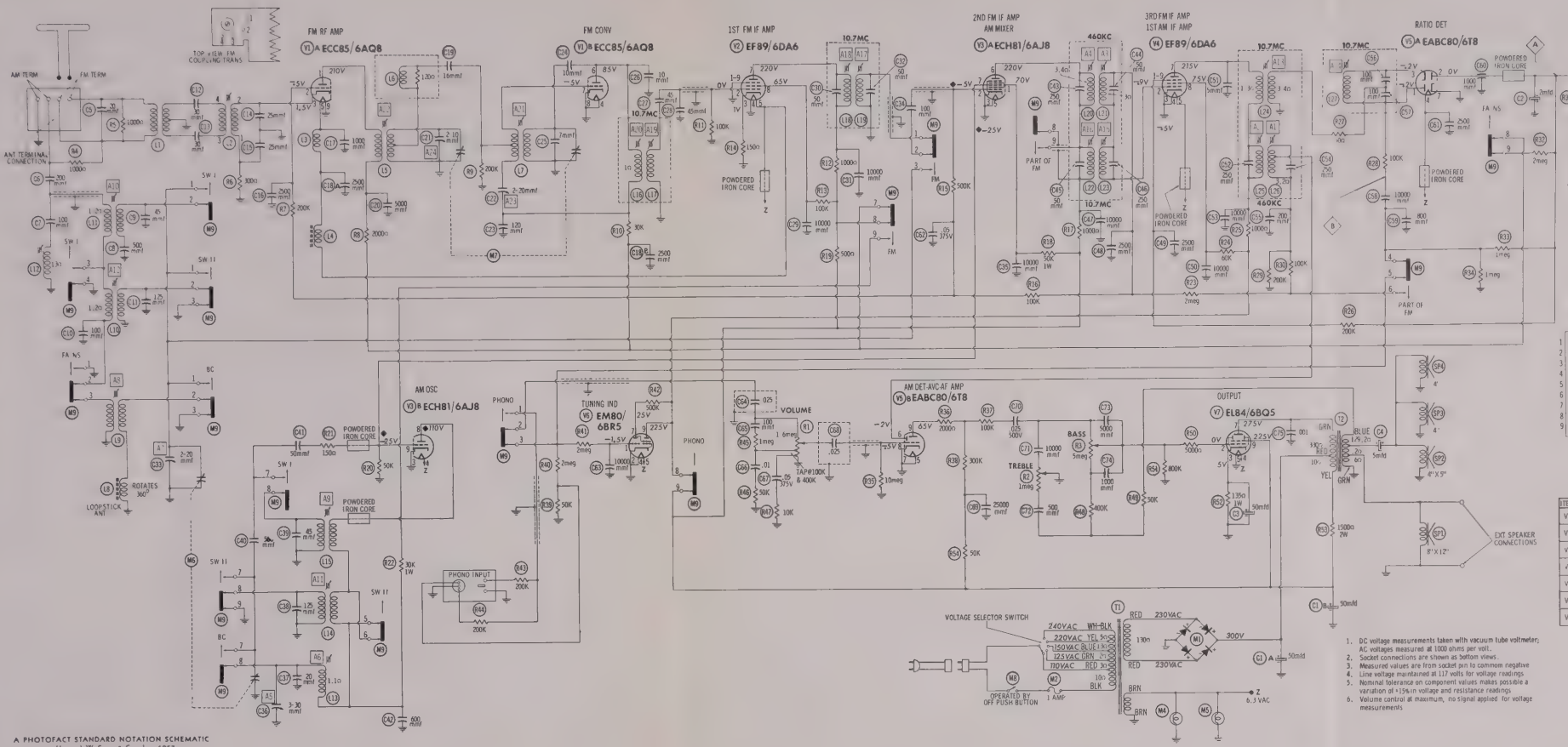
FIG. 2



FM RF SUB-CHASSIS



DIAL CORD STRINGING



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	↑ 4000Ω	2.6Meg	300Ω	0Ω	.1Ω	↑ 32K	200K	0Ω	0Ω
V2	EF89	0Ω	100K	150Ω	0Ω	.1Ω	NC	↑ 2500Ω	↑ 100K	0Ω
V3	ECH81	↑ 52K	2.9Meg	0Ω	.1Ω	0Ω	↑ 3000Ω	50K	1↑ 30K	50K
V4	EF89	230K	2.3Meg	0Ω	0Ω	1Ω	NC	↑ 2500Ω	↑ 60K	230K
V5	EABC80	1MF.	39K	1MF.	1Ω	0Ω	200K	0Ω	10Meg	↑ 350K
V6	EM80	2.2Meg	0Ω	NC	0Ω	1Ω	NC	↑ 600K	NC	↑ 1500Ω
V7	EL84	NC	400K	135Ω	1Ω	0Ω	NC	↑ 330Ω	NC	↑ 1500Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
↑ MEASURED FROM OUTPUT OF M1.
* MEASURED IN "BC" POSITION.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of +15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA BRAUN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C36	3-30									
C37	20			NPO-SI20	TCZ-20	CTA6Q2C	TCO-20	ZT-542	5TCC-Q2	
C38	125									
C39	45									
C40	500									
C41	50			NPO-SI50	TCZ-50	CTA6Q5C	TCO-50	ZT-545	5TCC-Q5	
C42	600									
C43	250			SI250	D6-251	LT6T25	GP-250	UC-5325	5GA-T25	
C44	50			SI50	D6-500	LT6Q5	GP-50	UC-545	5GA-Q5	
C45	50			SI50	D6-500	LT6Q5	GP-50	UC-545	5GA-Q5	
C46	250			SI250	D6-251	LT6T25	GP-250	UC-5325	5GA-T25	
C47	10000			SI10000	D6-103	LT6S1	GP-10000	UC-511	5GA-S1	
C48	2500			SI2500	D6-252	LT6D25	GP-2500	UC-5225	5GA-D25	
C49	2500			BPD-0025	DD-252	BYA10D25	ED-0025	UC-5225	5GA-D25	
C50	10000			SI10000	D6-103	LT6D25	GP-10000	UC-511	5GA-S1	
C51	5			SI5	D6-050	LT6V5	GP-5		5GA-V5	
C52	250			SI250	D6-251	LT6T25	GP-250	UC-5325	5GA-T25	
C53	10000			SI10000	D6-103	LT6S1	GP-10000	UC-511	5GA-S1	
C54	250			SI250	D6-251	LT6T25	GP-250	UC-5325	5GA-T25	
C55	200			SI200	D6-201	LT6T2	GP-200	UC-532	5GA-T2	
C56	100			SI100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C57	100			SI100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C58	10000			SI10000	D6-103	LT6S1	GP-10000	UC-511	5GA-S1	
C59	800			BPD-0008	DD-801				5GA-T8	
C60	1000			EF-001	MFT-1000				503C-D1	
C61	2500			SI2500	D6-252	LT6D25	GP-2500	UC-5225	5GA-D25	
C62	.05	375		BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C63	10000			SI10000	D6-103	LT6S1	GP-10000	UC-511	5GA-S1	
C64	.025	250						GEM-6125		
C65	100			SI100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C66	.01	250		SI10000	D6-103	CUB6S1	GP-10000	GEM-411	6TM-S1	
C67	.05	375		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C68	.025	250						GEM-4125		
C69	25000									
C70	.025	500						GEM-6125		
C71	10000			SI10000	D6-103	LT6S1	GP-10000	UC-511	5GA-S1	
C72	500			SI500	D6-501	LT6T5	GP-500	UC-535	5GA-T5	
C73	5000			SI5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C74	1000			SI1000	D6-102	LT6D1	GP-1000	UC-521	5GA-D1	
C75	.001	250		SI1000	D6-102	CUB6D1	GP-1000	GEM-621	6TM-D1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BRAUN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1.6Meg	1/2						Volume, Tap @ 100K & 400K
R2	1Meg	1/4						Treble
R3	5Meg	1/4						Bass

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA BRAUN PART No.	IRC PART No.	NOTES
R4	1000Ω			BTS-1000	
R5	1000Ω			BTS-1000	
R6	300Ω			BTS-300	
R7	200K			BTS-200K	
R8	2000Ω			BTS-2000	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA BRAUN PART No.	IRC PART No.	NOTES
R9	200K			BTS-200K	
R10	30K			BTS-30K	
R11	100K			BTS-100K	
R12	1000Ω			BTS-1000	
R13	100K			BTS-100K	

FOLDER 7

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA BRAUN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Trans.					
L2	FM Coupling Trans.					
L3	Fil. Choke					1.8 Microhenries
L4	Fil. Choke					14 Microhenries
L5	FM RF Trans.					
L6	RF Choke					Wound on 120Ω resistor.
L7	FM Osc. Coil					
L8	Loop Stick					
L9	Ant. Coil					
L10	Ant. Coil					
L11	Ant. Coil					
L12	IF Trap					
L13	Osc. Coil					
L14	Osc. Coil					
L15	Osc. Coil					
L16	1st FM IF Pri.					
L17	1st FM IF Sec.					
L18	2nd FM IF Pri.					
L19	2nd FM IF Sec.					
L20	1st AM IF Pri.					
L21	1st AM IF Sec.					
L22	3rd FM IF Pri.					
L23	3rd FM IF Sec.					
L24	Ratio Det. Trans.					
L25	2nd AM IF Pri.					
L26	2nd AM IF Sec.					
L27	Ratio Det. Coil					

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA BRAUN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	NOTES
M1	.070A	B250C100		60-9150 ①			① Two required.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA BRAUN PART No. FUSE	BRAUN PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2		1A250V						

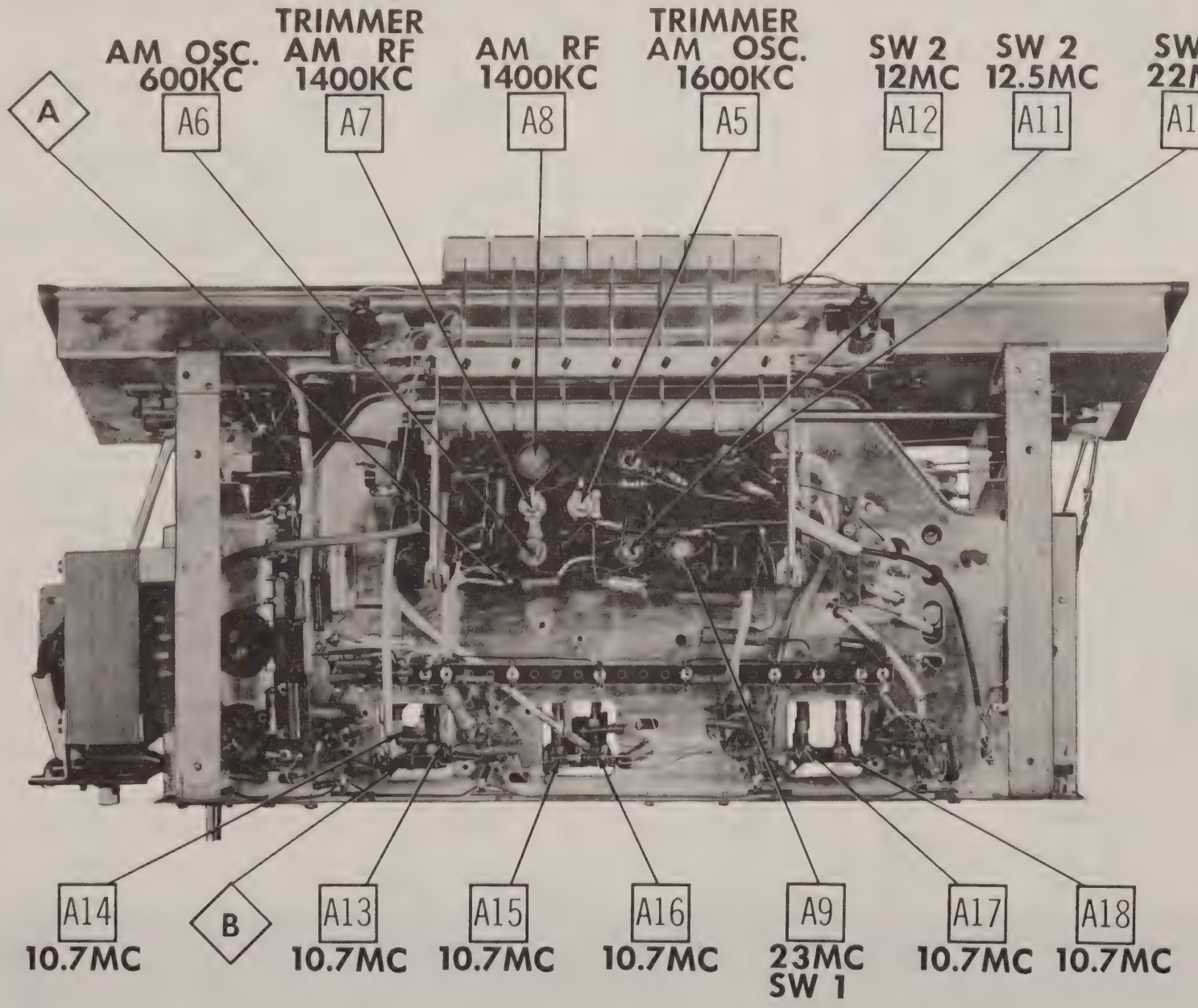
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA BRAUN PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M3		† ♦ TE-18SD or ♦ TE-18D		† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	BRAUN PART No.	NOTES
M4	Dial Light		6-8 Volts
M5	Dial Light		6-8 Volts
M6	Tuning Cap		(AM) 2 Gang (Ant. 20-500MMF, Osc. 20-550MMF)
M7	Tuning Cap		(FM) 2 Gang
M8	Switch		On-Off (Slide Type SPST)
M9	Switch		Keyboard Assembly



CHASSIS BOTTOM VIEW — ALIGNMENT IDENTIFICATION

PHOTOFACT* Folder

DUMONT
CHASSIS RA-902

PROPERTY OF
L. F. BLANKENSHIP
3924 [illegible] ST.
DENVER, COLORADO

DUMONT
CHASSIS RA-902

DUMONT
CHASSIS RA-902

TRADE NAME	Dumont Chassis RA-902
MANUFACTURER	Allen B. Dumont Laboratories Inc., 257 Sixteenth Ave., Passaic, N. J.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC
RATING	7.6MA @ 9 Volts DC
TUNING RANGE—BROADCAST	540KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod)	Tuning gang fully closed	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1620KC	Tuning gang fully open	"	A4, A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Retouch A4.
3.		"	600KC	600KC	"	A6	Adjust for maximum output while rocking tuning gang.
4.		"	1400KC	1400KC	"	A5	Adjust for maximum output while rocking tuning gang. Repeat steps 3 & 4. With chassis installed in cabinet and tuned to a weak station, adjust A5 for maximum volume.

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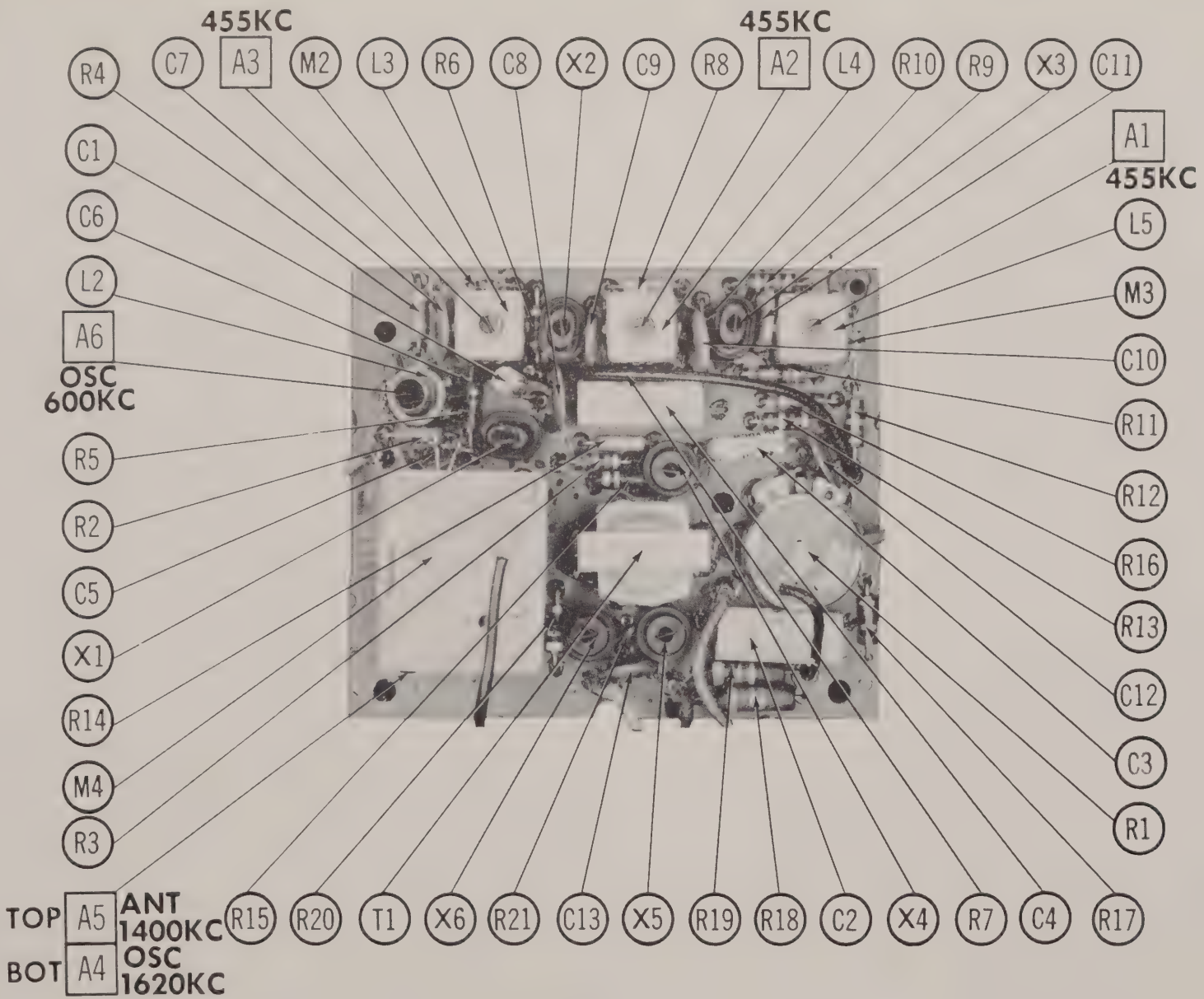
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N168A	Converter			2N94K	
X2	2N168	1st. IF Amplifier			2N94	Alternate Type 2N293
X3	2N168	2nd. IF Amplifier				Alternate Type 2N293
X4	2N192	AF Amplifier				Alternate Type CK882
X5	2N188	Output				Alternate Type CK888
X6	2N188	Output				Alternate Type CK888

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DUMONT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	10	3	03190203	XPP3V10	NL10-3	TT3X10	ML10-6		TE-1053
C2	100	10	03190205	PWE10V100	NL100-10				R2418 *
C3	4	10	03190201	PWE10V5	NL4-6	TT12X5	ML4-15		R2453 *
C4	100	10	03190205 ①	PWE10V100	NL100-10				R2418 *

① Some versions may use 50MFD in this application (Part #03190204).
* Non Catalog Item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DUMONT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	10000		03190181						TG-S10	
C6	10000		03190181						TG-S10	
C7	50000		03190182						TG-S50	
C8	50000		03190182						TG-S50	
C9	100000		03190183						TG-P10	
C10	50000		03190182						TG-S50	
C11	50000		03190182						TG-S50	
C12	50000		03190182						TG-S50	
C13	100000		03190183						TG-P10	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DUMONT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	10000Ω	½	01058364					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DUMONT PART No.	IRC PART No.	
R2	27K		02251940	BTS-27K	
R3	6800Ω		02251870	BTS-6800	
R4	470Ω		02251730	BTS-470	
R5	1500Ω		02251790	BTS-1500	
R6	82K		02252000	BTS-82K	
R7	1000Ω		02251770	BTS-1000	
R8	3900Ω		02251840	BTS-3900	
R9	33K		02251950	BTS-33K	
R10	6800Ω		02251870	BTS-6800	
R11	1000Ω		02251770	BTS-1000	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DUMONT PART No.	IRC PART No.	
R12	6800Ω		02251870	BTS-6800	
R13	6800Ω		02251870	BTS-6800	
R14	27K		02251940	BTS-27K	
R15	15K		02251910	BTS-15K	
R16	680Ω		02251750	BTS-680	
R17	180Ω		02251680	BTS-180	
R18	8.2Ω 5%		02100870		
R19	8.2Ω 5%		02100870		
R20	47Ω 5%		02250160	BTS-47 5%	
R21	100Ω		02310011		Note 1

Note 1. Temperature Compensating Type

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO INPUT)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DUMONT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2:	1	20011132	GH118 ①		TA-5 ①	TR-7 ①	TY-55X ①②	① Cut off mounting tabs and use leads for mounting support. ② Tape center tap on primary winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DUMONT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	490Ω CT	3-4Ω	20011112	GH5 ①			TR-27 ②	TY-45X ①	① Drill new mounting hole. ② Fabricate mounting.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DUMONT PART No.	QUAM PART No.	
SP1	3½"	PM	3-4Ω	18003873	3A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		DUMONT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	22002531				
L2	Osc. Coil	21006132				
L3	1st. IF	20011152	16-9003		2041	
L4	2nd. IF	20011152	16-9003		2041	
L5	3rd. IF	20011151	16-9004		2042	

BATTERIES

ITEM No.	VOLTAGE	DUMONT PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V		1		935		M-14		1LP		Six 1.5V cells in series

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		DUMONT PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N60G	26001892	1N60	1N60	AGC (Note 1)
M3	1N60G	26001892	1N60	1N60	Audio Det. (Note 1)

Note 1. Alternate Types: CK706A, 1N87G, 1N295

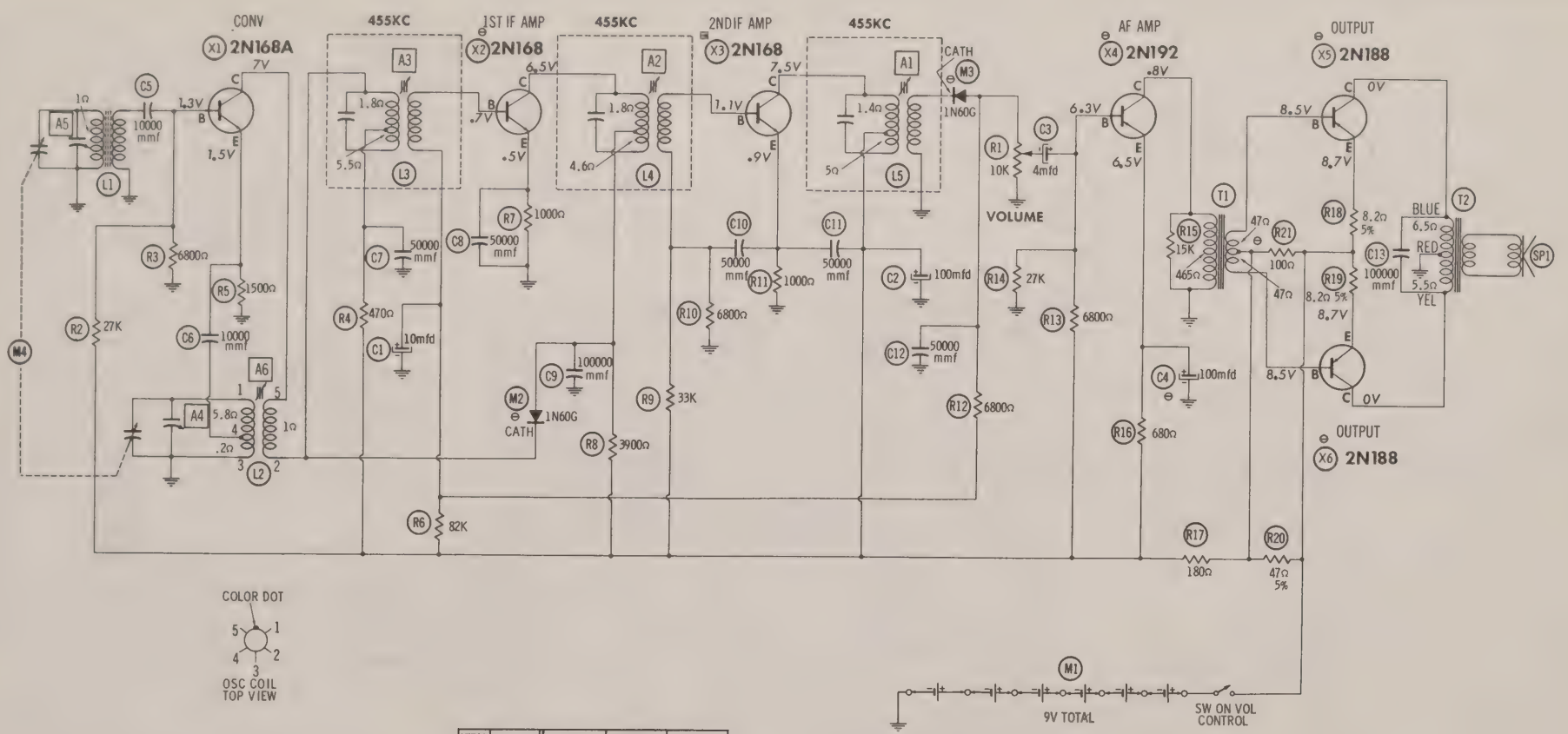
MISCELLANEOUS

ITEM No.	PART NAME	DUMONT PART No.	NOTES
M4	Tuning Cap.	03190051	2 Gang (Ant. 15-150MMF, Osc. 20-95MMF)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	45007861	Control
Dial	45007851	
Case	33035801	Leather, Green
Case	33035802	Leather, Red
Case	33035803	Leather, Tan



ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N168A	5300Ω	1500Ω	† 700Ω
X2	2N168	12K	1000Ω	† 3600Ω
X3	2N168	5500Ω	1000Ω	† 225Ω
X4	2N192	† 5500Ω	† 900Ω	400Ω
X5	2N188	† 78Ω	† 8.2Ω	6.5Ω
X6	2N188	† 78Ω	† 8.2Ω	5.5Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS
† MEASURED FROM JUNCTION OF R20 AND R21

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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GENERAL ELECTRIC MODELS P710A, B, C, P711A, B, C

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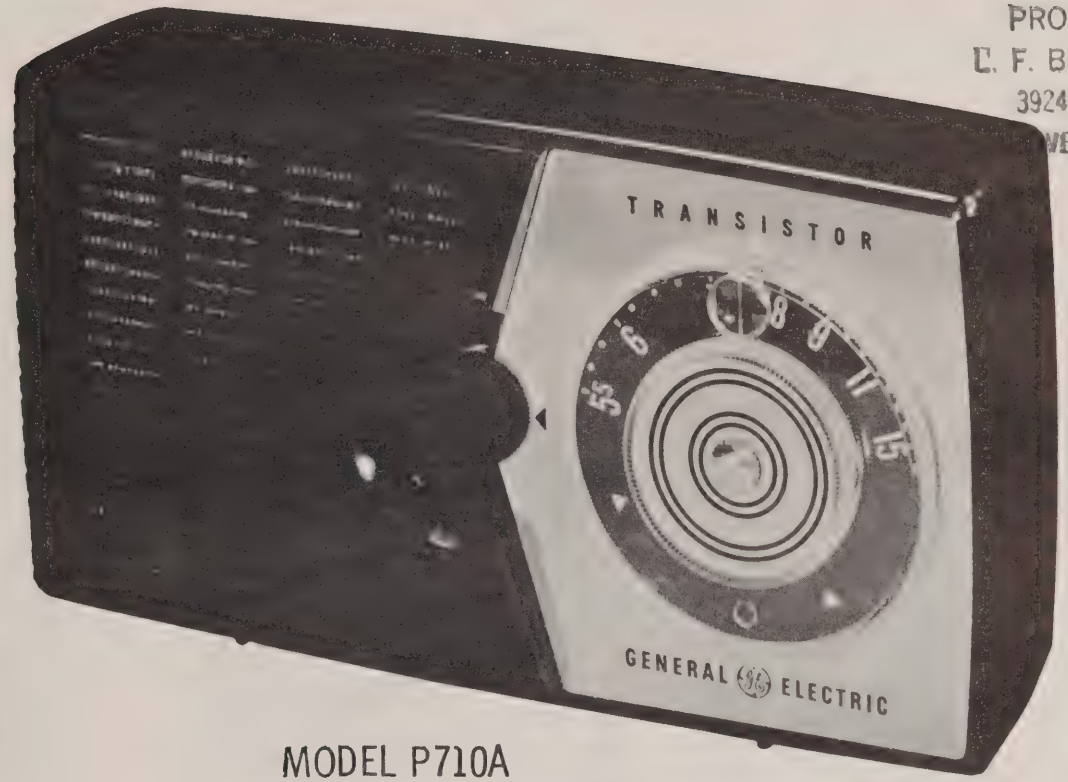
VER, COLORADO



MODEL P710A

GENERAL ELECTRIC MODELS
P710A, B, C, P711A, B, C

TRADE NAME	General Electric Models P710A, P710B, P710C, P711A, P711B, P711C
MANUFACTURER	General Electric Co., Products Service, Radio Receiver Dept., 869 Broad St., Utica, N. Y.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	6 Volts DC
RATING	9.7MA @ 6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to Antenna Stator Lug on tuning gang. Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.		Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang.
4.		"	580KC	580KC	"	A6	Adjust for maximum output while rocking tuning gang.

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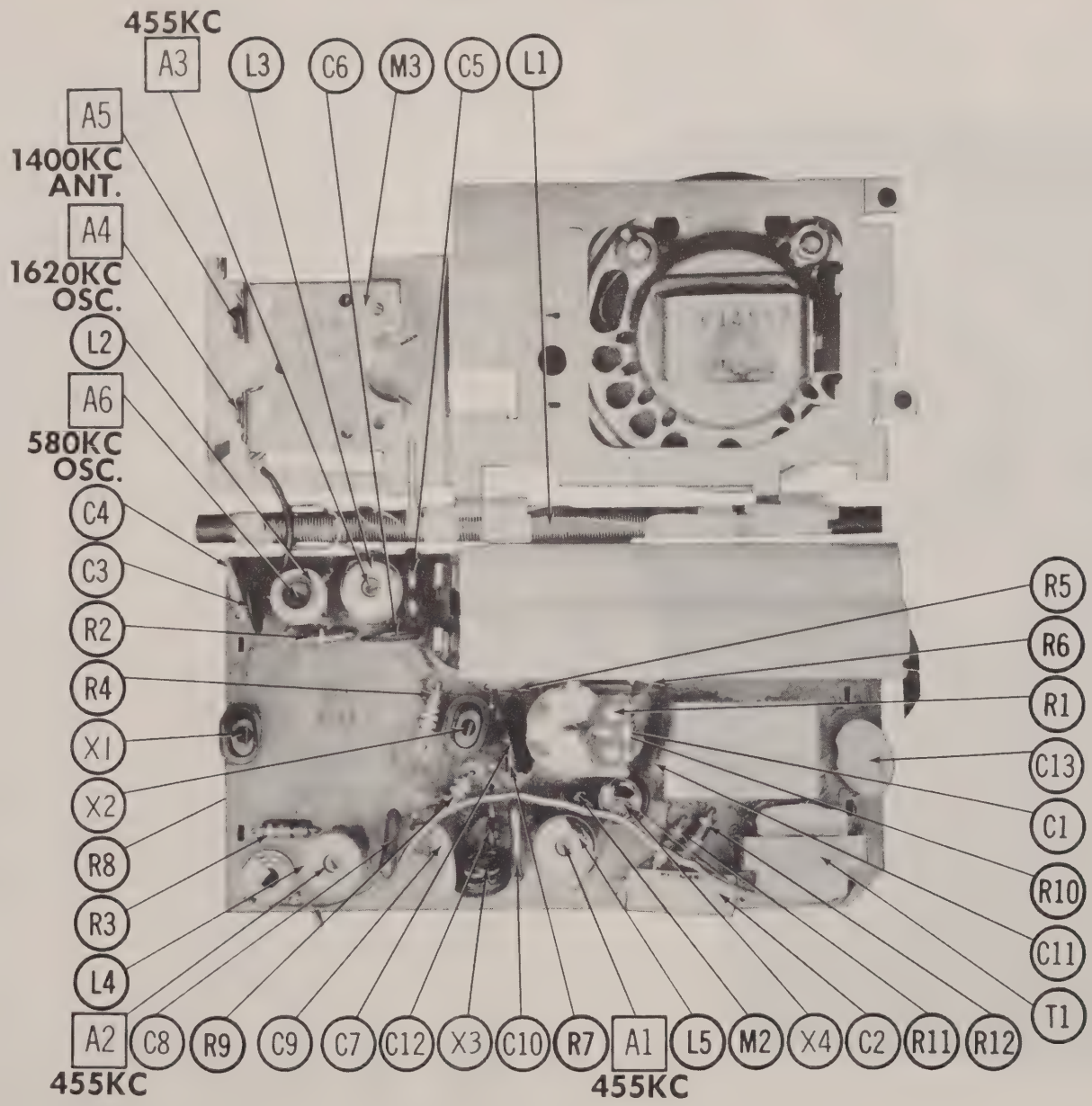
FOLDER 9



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N168A	Converter			2N94A	Alternate Type 2N164A
X2	2N292	1st. IF Amplifier				Alternate Type 2N313, 2N293, 2N169, 2N314
X3	2N169	2nd. IF Amplifier			2N94	Alternate Type 2N165
X4	2N188A	Output				Alternate Type 2N320

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	G. E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	20	8	RS-1048	XPP10V20	NL20-15		ML20-15		
C2	50	10	RS-1047	PWE10V50	NL50-10	TT10X50			R2305 *

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	G. E. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	10000		RS-1022	BPD-01	DD-103	BYA6S1	ED-01	DC511	TG-S10	
C4	10000		RS-1022	BPD-01	DD-103	BYA6S1	ED-01	DC511	TG-S10	
C5	820		RS-1058							5%
C6	3000		RS-1053		DD-302	BYA10D3	ED-003	UC-523	5GA-D3	
C7	10000		RS-1022	BPD-01	DD-103	BYA6S1	ED-01	DC511	TC-S10	Note 1
C8	510		RS-1049							5%
C9	8200		RS-1112							Note 2
C10	470		RS-1050							5%
C11	50000		RS-1024						TG-S50	
C12	1000		RS-1051	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5GA-D1	
C13	50000		RS-1024						TG-S50	

Note 1. Not used in some versions.
Note 2. Some versions may use 3000MMF in this application (Part #RS-1053).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	100K	1/4	RS-1038					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	G. E. PART No.	IRC PART No.	
R2	150K			BTS-150K	
R3	1000Ω			BTS-1000	
R4	33K			BTS-33K	
R5	1000Ω			BTS-1000	
R6	2200Ω			BTS-2200	
R7	330Ω			BTS-330	Note 1

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	G. E. PART No.	IRC PART No.	
R8	3.3Meg			BTS-3.3Meg	Note 2
R9	47K			BTS-47K	Note 3
R10	2200Ω		RS-1092		Note 4
R11	10Ω			BTS-10	
R12	680Ω			BTS-680	Note 5

Note 1. Some versions may use 120Ω in this application.
Note 2. Value may vary from 1Meg to 6.8Meg.
Note 3. Some versions may use 22K in this application.
Note 4. Temperature compensating type.
Note 5. Some versions may use 390Ω in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	G. E. PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	450Ω	18Ω	RS-1054	GH103 ①			TR-16 ①	TY-45X ① ②	① Tape center tap on Prim. ② Remove channel mounting frame.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	G. E. PART No.	QUAM PART No.	
SP1	2 3/4"	PM	18Ω	RS-1039		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		G. E. PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	RS-1040			2003	
L2	Osc. Coil	RS-1043				
L3	1st. IF	RS-1046				
L4	2nd. IF	RS-1045				
L5	3rd. IF	RS-1044				

BATTERIES

ITEM No.	VOLTAGE	G. E. PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	6V		Z		1015 or 915 (Mercury cell E9)		M-15 or (Mercury cell ZM-9)		7R		Four 1.5V cells in series

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		G. E. PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N87		1N60	1N60	Audio Det. (Pigtail)

MISCELLANEOUS

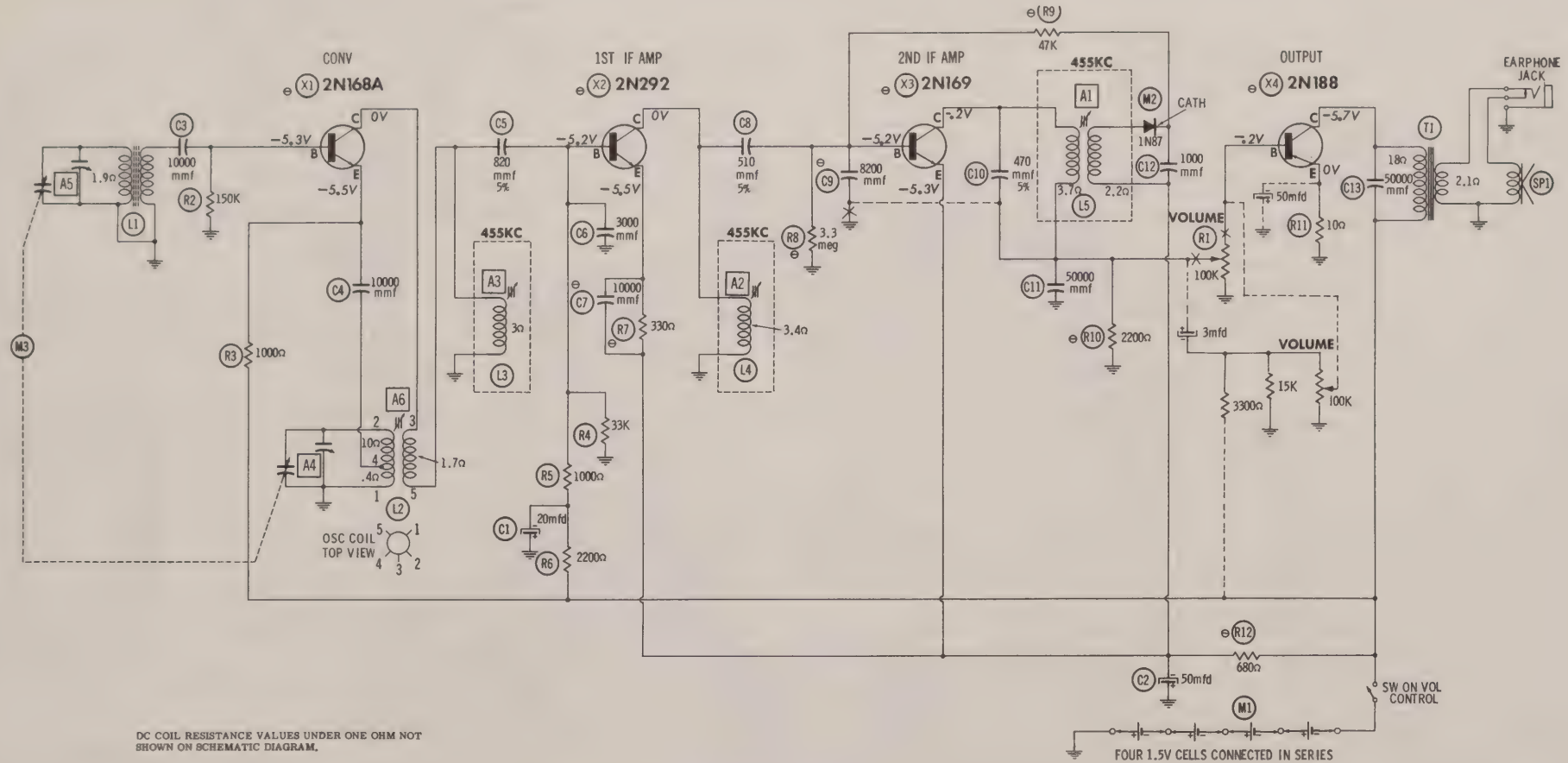
ITEM No.	PART NAME	G. E. PART No.	NOTES
M3	Tuning Cap.	RS-1037	2 Gang (Ant. 18-135MMF, Osc. 18-95MMF)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	RS-1032	Clear Tuning
Knob	RS-1033	Black On-Off-Volume, Model P710A, B, C
Knob	RS-1113	Turquoise On-Off-Volume, Model P711A, B, C
Cabinet	RS-1041	Black, Model P710A, V, C
Cabinet	RS-1042	Turquoise, Model P711A, B, C
Earphone Jack	RS-1195	(3 Terminals)
Earphone Jack	RJS-230	
Chassis Assembly	RS-1135	

GENERAL ELECTRIC MODEL P710A



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

TRANSISTOR RESISTANCE NOT TAKEN BECAUSE OF WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

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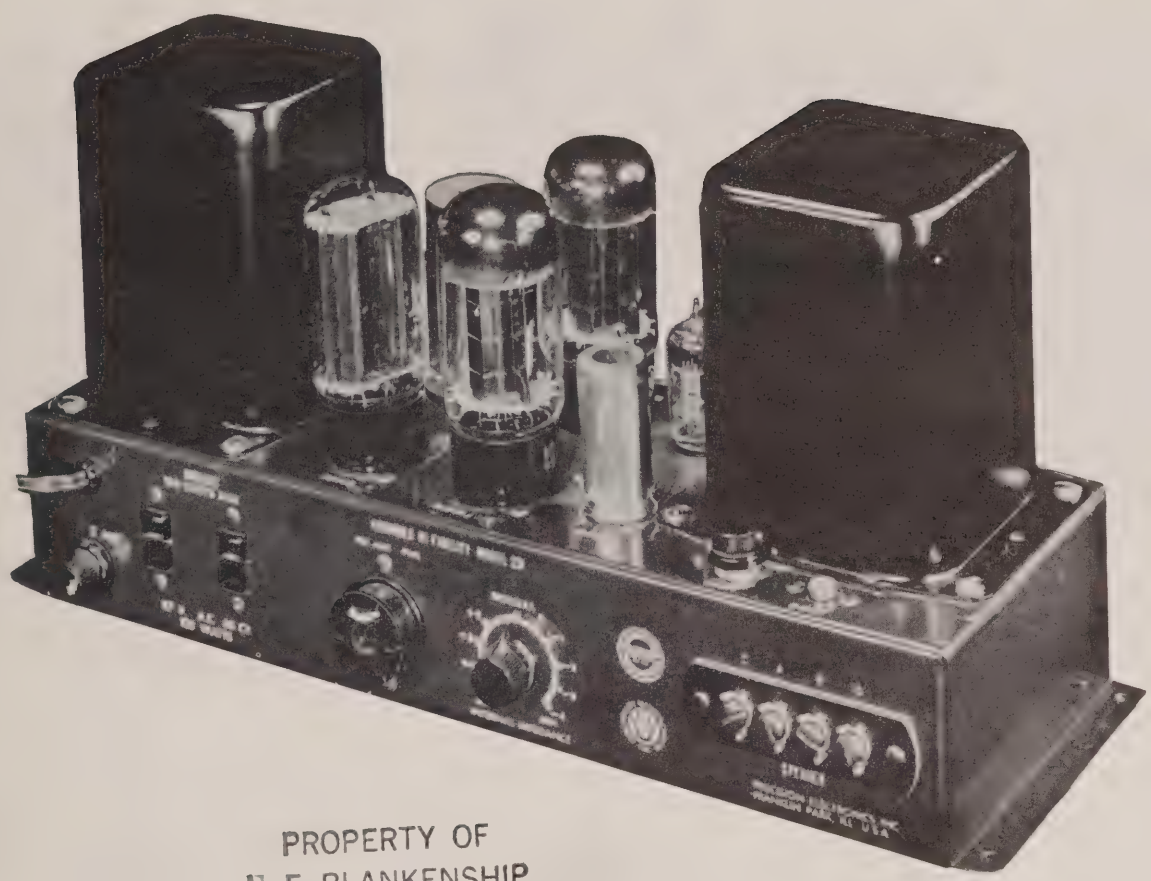
GROMMES MODELS 221

GROMMES MODELS 221



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

GROMMES MODELS 221

TRADE NAME	Grommes Model 221
MANUFACTURER	Precision Electronics, Inc. 9101 King Ave., Franklin Park, Ill.
TYPE SET	AC Operated Audio Amplifier
TUBES (Five)	Types 12AU7 AF Amplifier, 12AU7 AF Amp. - Phase Inv., (2) 6L6GB (or) 5881 Output, 5U4GB Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .9 Amp. @ 117 Volts AC (9 Watts)

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DATE 10-57 SET 375 FOLDER 10

PARTS LIST AND DESCRIPTIONS

GROMMES MODEL 221

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AU7	
V2	AF Amp. - Phase Inv.	12AU7	
V3	Output	6L6GB	Note 1

ITEM No.	USE	TYPE	NOTES
V4	Output	6L6GB	Note 1
V5	Rectifier	5U4GB	

Note 1. Some versions may use type 5881

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	GROMMES PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450		AFH3-50-05	C0372	FP396.1	TMQ-12	Q-040	TVL-3842
B	■20	450							
C	▲20	450							
C2	10	250		PRS350V10	BR1045	TC52	TD-10-250	MT-4510	TVA-1504
C3	50	50		PRS50V50	BR505	TC39	TD-50-50	MT-0550	TVA-1308

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	GROMMES PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	.22	200		P288N-22		CUB2P22		GEM-2022	2TM-P22	
C5	250			BPD-00025	DD-251	L10T25	ED-250	UC-5325	5GA-T25	
C6	.22	200		P288N-22		CUB2P22		GEM-2022	2TM-P22	
C7	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C8	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C9	20			NP0-SI 20	D6-200	L10Q2	ED-20			10%

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	GROMMES PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	VC500K	B-60	A47-500K-Z	Q13-133	U48	Gain
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R2A	1Ω	4						Damping (Wire Wound)
B	1Ω	4						Damping (Wire Wound)

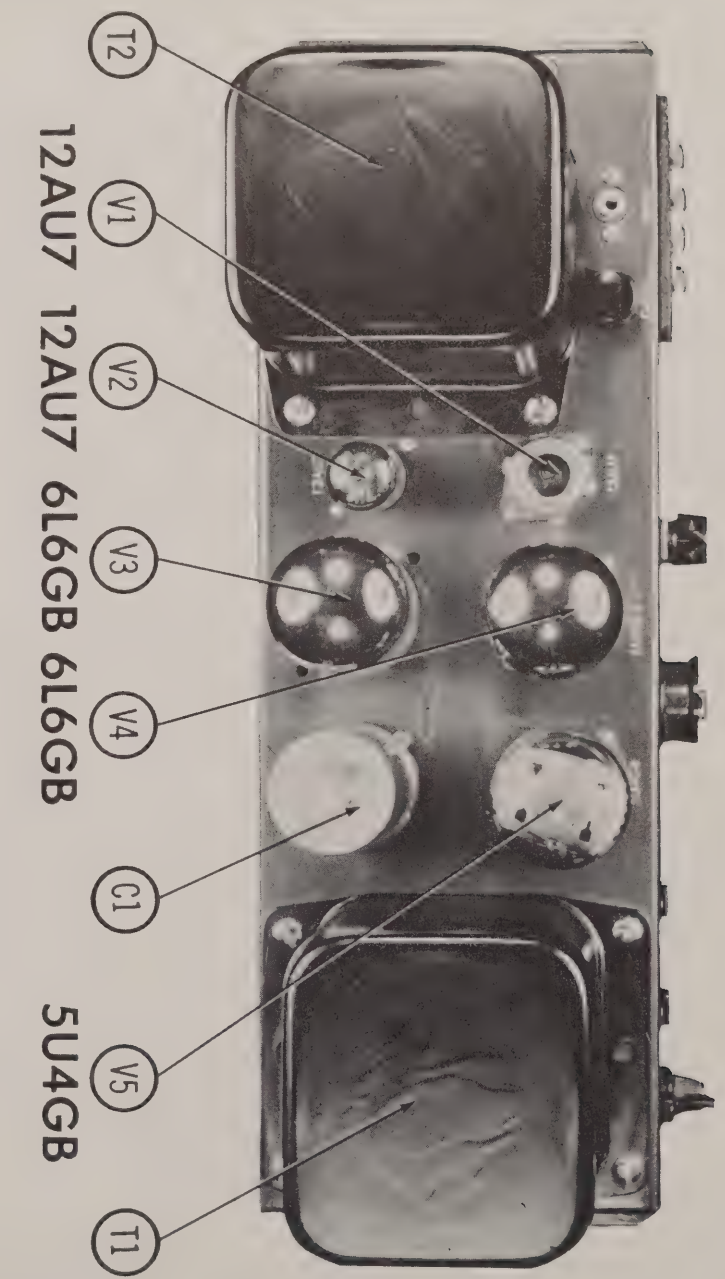
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GROMMES PART No.	IRC PART No.	
R3	1Meg			BTS-1Meg	
R4	22K			BTS-22K	
R5	100K	1		BTA-100K	
R6	100K			BTS-100K	
R7	1000Ω			BTS-1000	
R8	22K			BTS-22K	
R9	2200Ω			BTS-2200	
R10	1Meg			BTS-1Meg	
R11	47K	1		BTA-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GROMMES PART No.	IRC PART No.	
R12	56K	1		BTA-56K	
R13	22K	2		BTB-22K	
R14	1000Ω			BTS-1000	
R15	100K			BTS-100K	
R16	1000Ω			BTS-1000	
R17	100K			BTS-100K	
R18	400Ω	10		1 3/4A-400	
R19	22K			BTS-22K	
R20	22K	2		BTB-22K	
R21	10K	1		BTA-10K	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ② .9A	760VCT ② .110A	5VAC ② 3A	6.3VCT ② 2.5A	TP5UA				25R06	HSM-207 ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6800Ω CT	16Ω Tap② 8Ω, 4Ω	T022	H4111	A-3102		22S39	HSM-186 ①	① Drill new mounting holes.

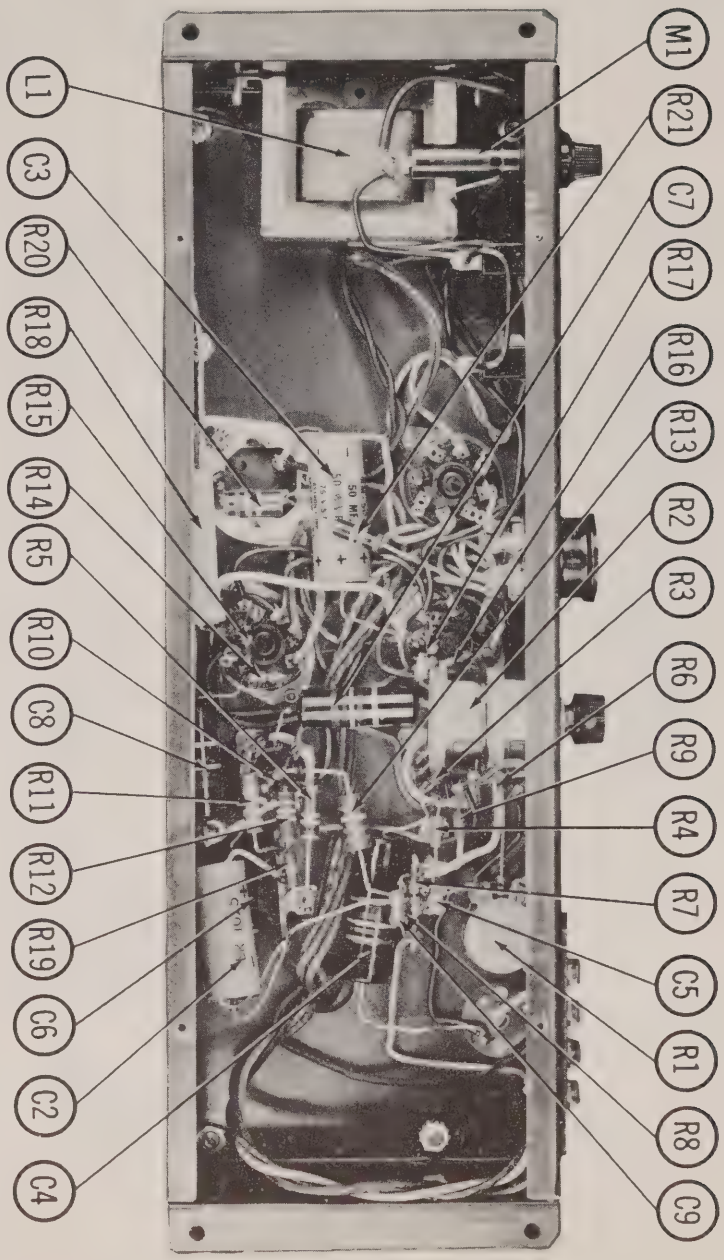
FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L1	.110A	51Ω	2Hy	CH2	C5026	C-2974	C-2304	26C43	C-23X

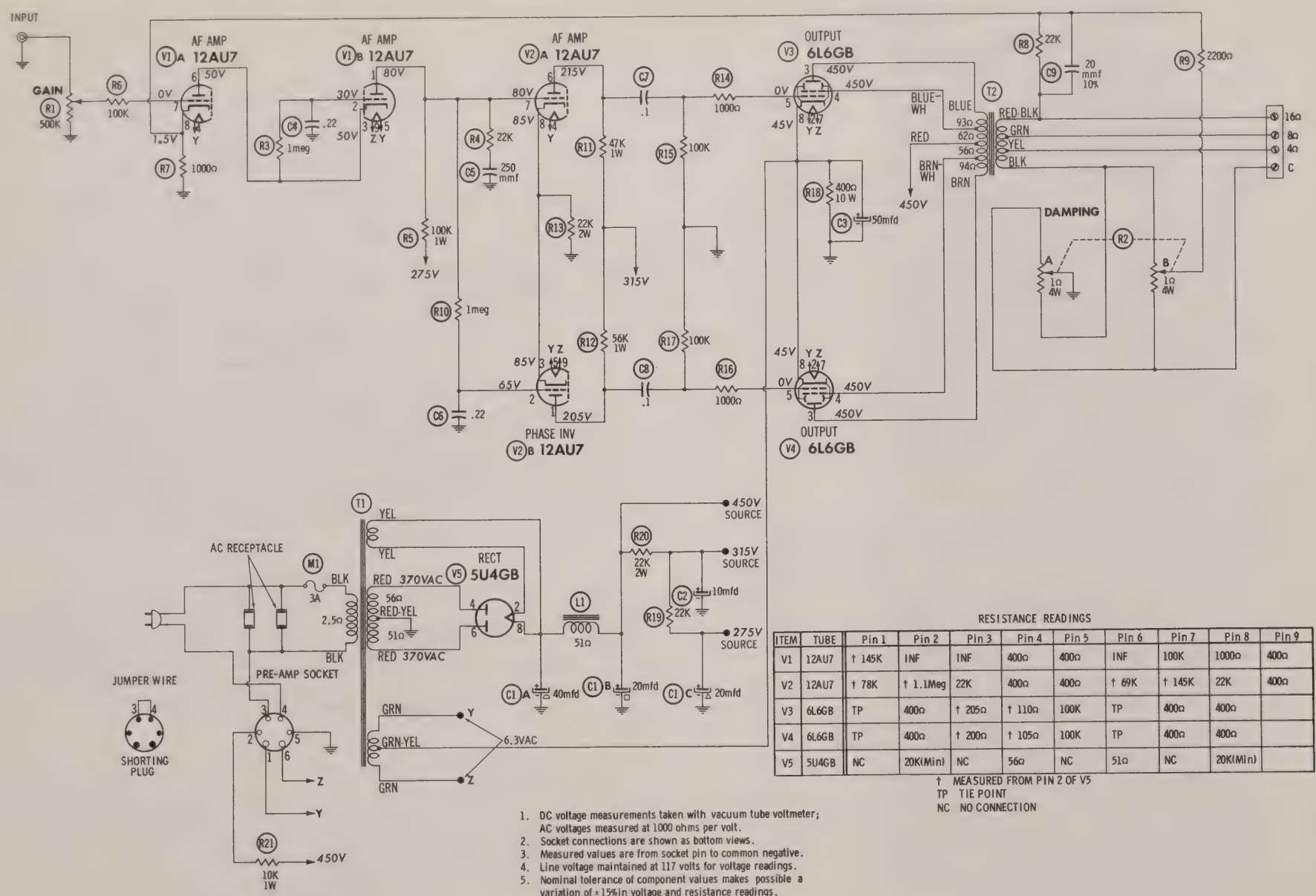
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			GROMMES PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3A			312003. (3AG-3A)	342001	AGC3	HCM

CHASSIS—BOTTOM VIEW



GROMMES MODEL 221



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7	† 145K	INF	INF	400Ω	400Ω	INF	100K	1000Ω	400Ω
V2	12AU7	† 78K	† 1.1Meg	22K	400Ω	400Ω	† 69K	† 145K	22K	400Ω
V3	6L6GB	TP	400Ω	† 205Ω	† 110Ω	100K	TP	400Ω	400Ω	
V4	6L6GB	TP	400Ω	† 200Ω	† 105Ω	100K	TP	400Ω	400Ω	
V5	5U4GB	NC	20K(Min)	NC	56Ω	NC	51Ω	NC	20K(Min)	

† MEASURED FROM PIN 2 OF V5
TP TIE POINT
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PHOTOFACT* Folder

*TRADE MARK

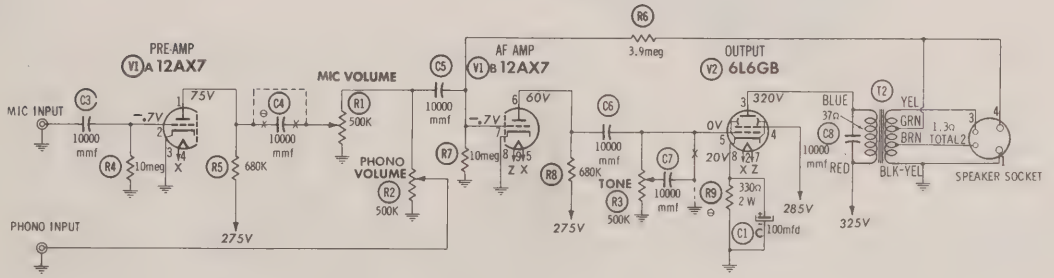
HAMILTON MODEL W-7

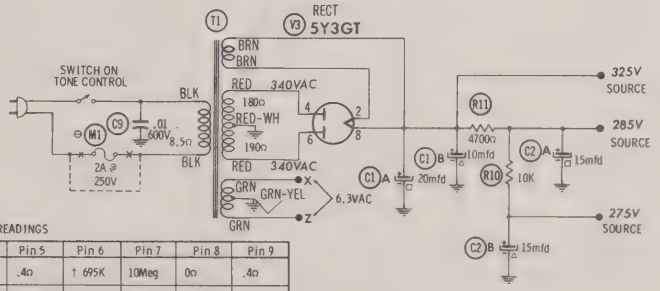
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HAMILTON
MODEL W-7

TRADE NAME	Hamilton Model W-7
MANUFACTURER	Hamilton Electronics Corp., 2726 W. Pratt Ave., Chicago 45, Illinois
TYPE SET	AC Operated 2 Channel Audio Amplifier
TUBES (Three)	Types 12AX7 Mic. Preamp. - AF Amp., 6L6GB Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .55 Amp. @ 117 Volts AC (55 Watts)

HAMILTON
MODEL W-7





SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	↑ 695K	10Meg	0Ω	.4Ω	.4Ω	↑ 695K	10Meg	0Ω	.4Ω
V2	6L6GB	TP	.4Ω	↑ 37Ω	↑ 4700Ω	500K	TP	.4Ω	330Ω	
V3	5Y3GT	NC	20K(Min)	TP	180Ω	NC	190Ω	NC	20K(Min)	

↑ MEASURED FROM PIN 8 OF V3
NC NO CONNECTION
TP TIE POINT

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Howard W. Sams & Co., Inc. 1957

375-11

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G993

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier-AF Amplifier	12AX7	
V2	Output	6L6GB	
V3	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	HAMILTON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■20	475		AFH3-157	C1150	FP175	TMS-68	S-295	TVL-3928
B	▲10	475				TC2501	TD-100-25	MTH-2510	
C	100	25							
C2A	■15	400		AHF2-43	BO380	FP258	TMD-41	D-180	TVL-2660
B	▲15	400							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	HAMILTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C4	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	Note 1
C5	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C8	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C9	.01	600		BPD-01	DD-103	CUB6S1	GP-10000	GEM-611	6TM-S1	

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	HAMILTON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½		B-60	A47-500K-Z	Q13-133	U48	Mic Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	500K	½		B-60	A47-500K-Z	Q13-133	U48	Phono Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½		B-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	HAMILTON PART No.	IRC PART No.	NOTES
R4	10Meg			BTS-10Meg	
R5	680K			BTS-680K	
R6	3.9Meg			BTS-3.9Meg	
R7	10Meg			BTS-10Meg	
R8	680K			BTS-680K	
R9	330Ω	2		BTB-330	Note 1
R10	10K			BTS-10K	
R11	4700Ω			BTS-4700	

Note #1. Some versions may use 270Ω 2 W.

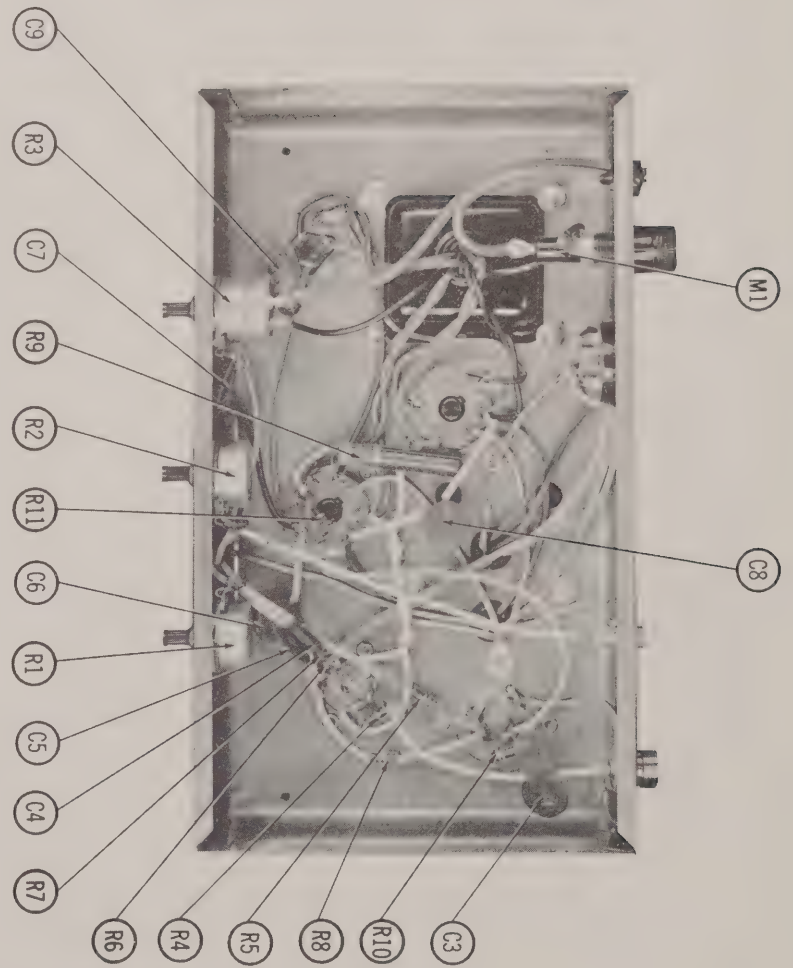
TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	HAMILTON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .55A	660VCT @ .062A	5VAC @ 2A	6.3VCT @ 1.1A		P9303	P-2951	PM8407	22R02	R-7B

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	HAMILTON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	1100Ω	15Ω taps @ 8Ω, 4Ω		Z1108 ①	A-3014①	A-3310 ①	22S95 ②	S-22A ②	① Drill new mtg. hole(s). ② Tape center tap on primary winding and drill new mtg. holes.

CHASSIS—BOTTOM VIEW



FUSES

ITEM No.	TYPE	RATING	HAMILTON PART No. FUSE	HAMILTON PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER	NOTES
M1	3AG	2A 250V			312002. (3AG2A)	342001	AGC2	HKP	Not used in some sets

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

KNIGHT
MODELS 93SZ505, 93SZ737

KNIGHT
MODELS 93SZ505, 93SZ737

MODEL 93SZ737

KNIGHT
MODELS 93SZ505, 93SZ737

TRADE NAME	Knight Models 93SZ505, 93SZ737
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Illinois
TYPE SET	AC Operated 16 Watt 3 Channel Audio Amplifier (Model 93SZ737 Has 4 Speed Manual Record Player)
TUBES (Five)	Types 6AV6 Mic. Preamplifier, ECC83 (or) 12AD7 (or) 12AX7 AF Amplifier, (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .6 Amp. @ 117 Volts AC, 62 Watts

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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H170

DATE 10-57 SET 375 FOLDER 12

PARTS LIST AND DESCRIPTIONS

KNIGHT
MODEL 93SZ505

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mic. Preamplifier	6AV6	
V2	AF Amplifier	ECC83/ 12AX7	Note 1
V3	Output	6V6GT	
V4	Output	6V6GT	
V5	Rectifier	5Y3GT	

Note 1. Some versions use a 12AD7 in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▬40	450		AFH3-41	C0320	FP396.2	TMT-36	Q-055	TVL-3783
B	■10	450							
C	▲10	450							
C2	8	450		PRS450V8	BR845	TC71	TD-8-450	MT-4508	TVA-1704
C3	35	50		PRS150V40	BR505	TC48	TD-40-150	MT-1540	TVA-1308

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C5	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	500				DD-501		ED-500			10%
C7	150				DD-151	L10T15	ED-150			10%
C8	2200									10%
C9	.047	600		P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C10	.047	600		P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C11	.047	600		P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C12	.047	600		P688N-047	DF-503	CUB6S57		GEM-6147	6TM-S47	
C13	.02	600		P688N-02	DD-203	CUB6S2		GEM-612	6TM-S2	

CONTROLS

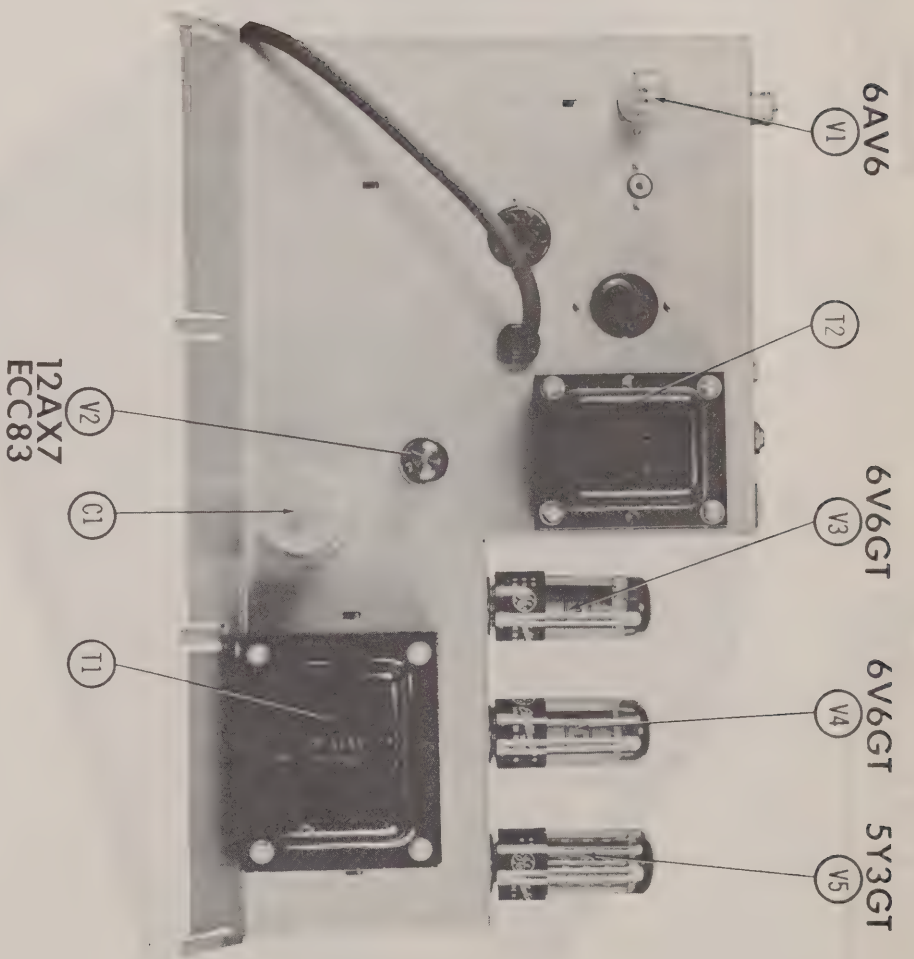
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	RP-105AC-C	B-70	A47-1Meg-Z	Q13-137	U53	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2	4Meg	½	RP-405A					Phono #1 & #2, Tap ⓐ 2Meg
R3A	1Meg	½	RP-105A	B-70	A47-1Meg-Z	Q13-137	U53	Mic. Input
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KNIGHT PART No.	IRC PART No.	
R4	10Meg			BTS-10Meg	
R5	470K			BTS-470K	
R6	220K			BTS-220K	
R7	470K			BTS-470K	
R8	470K			BTS-470K	
R9	2700Ω			BTS-2700	
R10	330K			BTS-330K	
R11	470K			BTS-470K	
R12	470K			BTS-470K	
R13	100K			BTS-100K	
R14	1000Ω			BTS-1000	
R15	100K			BTS-100K	
R16	470K			BTS-470K	
R17	250Ω	4		PW4-250	
R18	470K			BTS-470K	
R19	3300Ω	1		BTA-3300	
R20	10K			BTS-10K	
R21	22K			BTS-22K	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .6A	640VCT @ .076A	5VAC @ 2A	6.3VCT @ 1.5A	LP-0258	P9315	P-2953	PM8410	22R05	R-148

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6900Ω CT	500Ω Tap @ 70V, 250Ω, 16Ω, 8Ω, 4Ω	L0-0150						

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	KNIGHT PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1		55T * P-55-T	GD	56 * 2756	PT-2	* Tone Arm Complete With Cartridge.

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

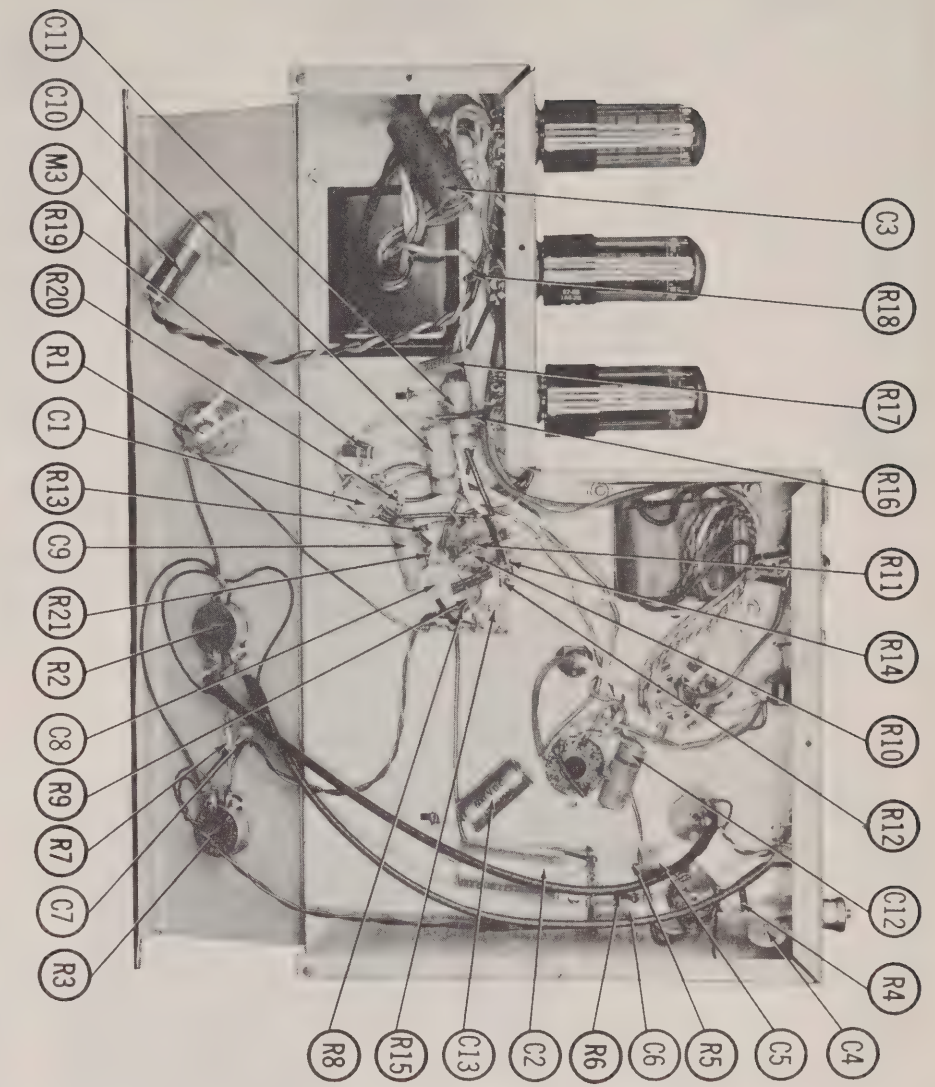
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	KNIGHT PART No.	JENSEN PART No.	WALCO PART No.	
M2		† A-71 or †♦ A-71SD or ♦ A-71D	* W-8TPA or † W-8TPS or †♦ W-8DS or ♦ W-8TPD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M3	Panel Lamp		#1847

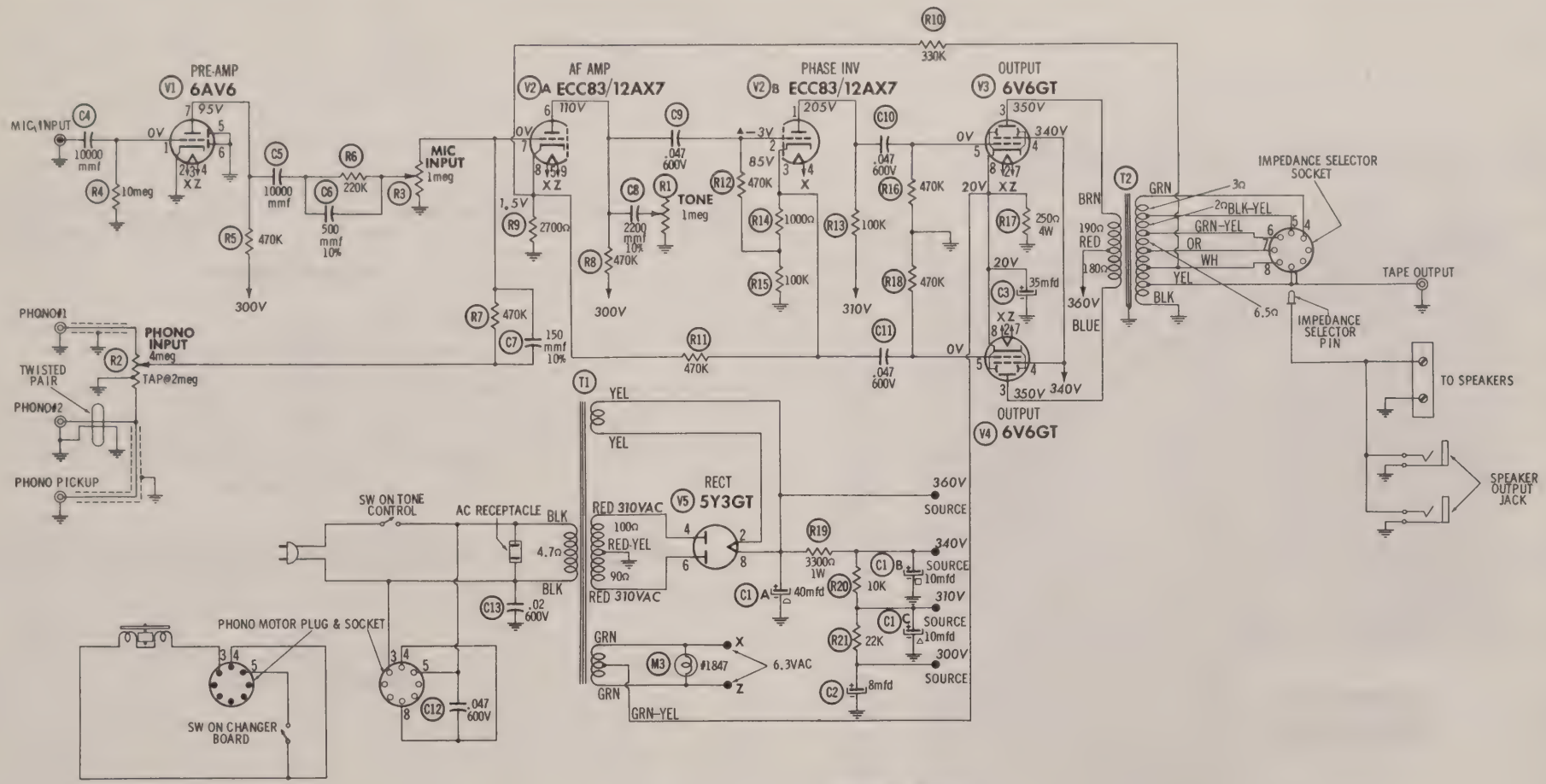
CHASSIS—BOTTOM VIEW



KNIGHT MODEL 93SZ505

KNIGHT MODEL 93SZ505

FOLDER 12



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AV6	10Meg	0Ω	250Ω	250Ω	0Ω	0Ω	† 500K		
V2	ECC83/ 12AX7	† 110K	570K	100K	250Ω	250Ω	† 500K	650K	2500Ω	250Ω
V3	6V6GT	0Ω	250Ω	† 190Ω	† 3300Ω	470K	NC	250Ω	250Ω	
V4	6V6GT	0Ω	250Ω	† 180Ω	† 3300Ω	470K	NC	250Ω	250Ω	
V5	5Y3GT	NC	20K(Min)	TP	100Ω	TP	90Ω	NC	20K(Min)	

† MEASURED FROM PIN 2 OF V5
▲ MEASURED FROM PIN 3 OF V2
TP TIE POINT
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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Howard W. Sams & Co., Inc. 1957

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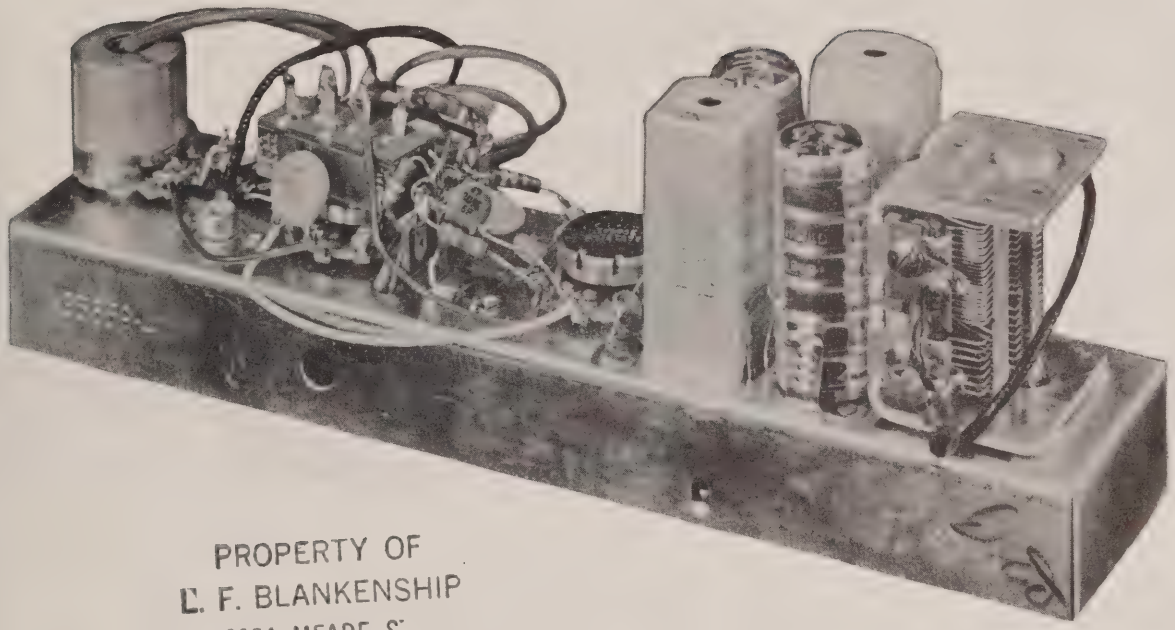
*TRADE MARK

MAGNAVOX CHASSIS CR-740AA

MAGNAVOX CHASSIS CR-740AA



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

MAGNAVOX CHASSIS CR-740AA

TRADE NAME	Magnavox Chassis CR-740AA
MANUFACTURER	Magnavox Co., 2131 Bueter Rd., Fort Wayne 4, Indiana
TYPE SET	Externally Powered AM Tuner
TUBES (Two)	Types 6BE6 Converter, 6BZ6 IF Amplifier
POWER SUPPLY	Externally Powered
TUNING RANGE—BROADCAST	540KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1	.01MFD	High side to pin 7 (grid) of 6BE6 (V1). Low side to chassis.	455KC (400~ Mod)	Quiet point near mid-range	Across C5	A1, A2, A3, A4	Adjust for maximum output.
2	"	"	1620KC	Tuning gang fully open	"	A5	"
3		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4		"	600KC	600KC	"	A7	If necessary, adjust movable part of rod antenna for maximum output. Repeat steps 3 & 4.

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PARTS LIST AND DESCRIPTIONS

MAGNAVOX
CHASSIS CR-740AA

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	6BE6	

ITEM No.	USE	TYPE	NOTES
V2	IF Amplifier	6BZ6	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	47		250218-17	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C2	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C3	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C4	1500		250218-18	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-D15	
C5	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C6	10000		250218-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	470		250218-15	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C8	220				DD-221	L10T22	ED-220	UC-5322	5GA-T22	Note 1
C9	2000		250218-20	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C10	1000		250218-8	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C11	47		250218-17	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C12	1000		250218-8	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C13	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	Note 2

Note 1. Some versions may use 68MMF (Part #250218-7)
Note 2. Some versions may use 220MMF (Part #250218-5)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.3Meg	½	220131-9					Loudness, Tap ② 300K & 2Meg
B	Shaft							
R2A	2Meg	½	220119-4					Bass ①
B	Switch							Radio-Phono
R3A	1Meg	½	220123-27	B-69	A47-1Meg-S	Q11-137	U54	Treble ②
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	On-Off
D	Cover			KB-5	③	③	③	

① Some versions may use 3.3Meg.
② Alternate part #220123-26.
③ If original switch cover does not fit replacement, cover switch terminals with tape.

RESISTORS

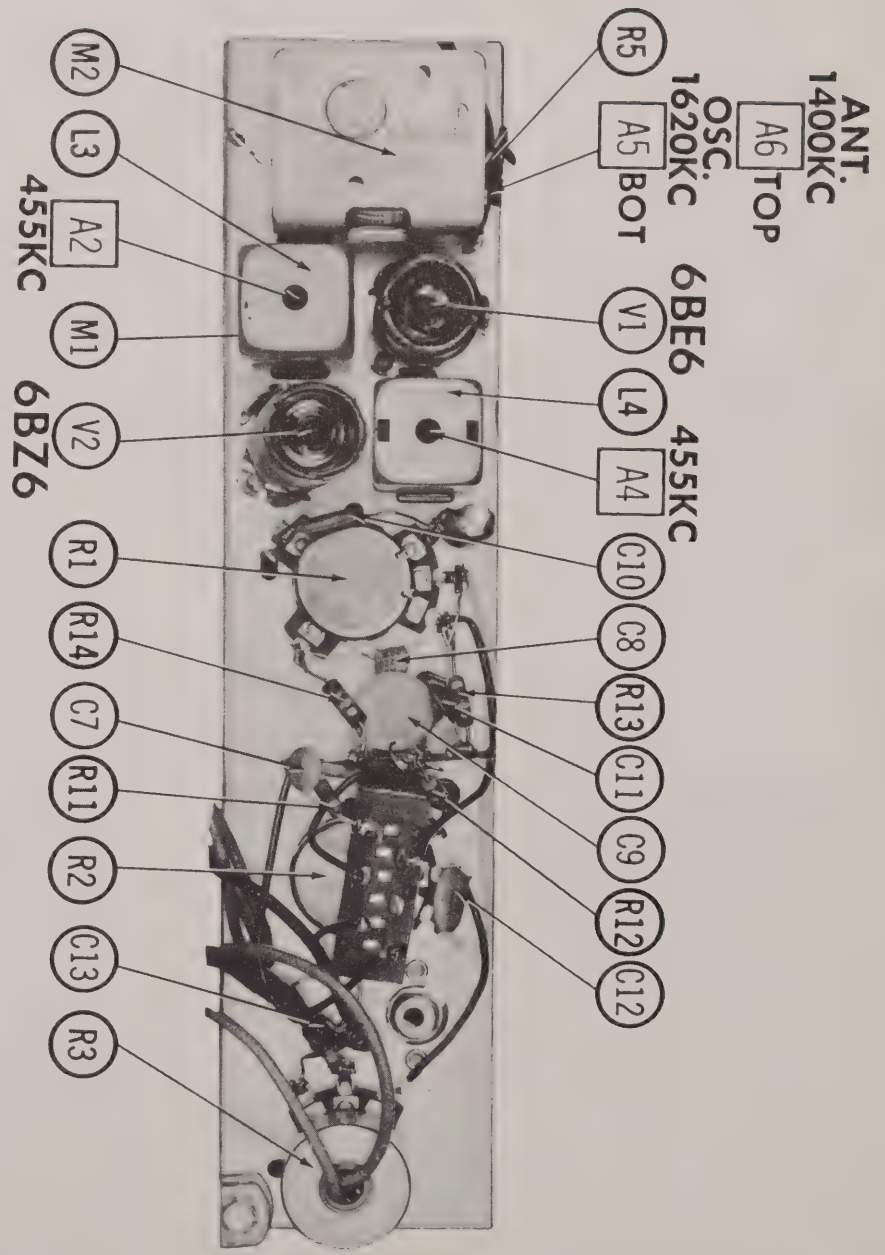
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MAGNAVOX PART No.	IRC PART No.	NOTES
R4	22K		230104-78	BTS-22K	
R5	100Ω		230104-50	BTS-100	Note 1
R6	15K		230104-76	BTS-15K	
R7	3.3Meg		230104-104	BTS-3.3Meg	
R8	3300Ω			BTS-3300	Note 2
R9	47K		230104-83	BTS-47K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MAGNAVOX PART No.	IRC PART No.	NOTES
R10	220K		230104-90	BTS-220K	
R11	4.7Meg		230104-106	BTS-4.7Meg	
R12	220K		230104-90	BTS-220K	
R13	3.3Meg		230104-104	BTS-3.3Meg	
R14	68K		230104-84	BTS-68K	
R15	180Ω		230104-53	BTS-180	

Note 1. Not used in some versions.
Note 2. Some versions may use 4700Ω (Part #230104-70)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1 L2 L3 L4	Loop Stick Osc. Coil Input IF Output IF	360705-1 360702-1 360611-1 360703-1	16-6750	14-1074 BC-352	12-C1	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MAGNAVOX PART No.	REPLACEMENT DATA	
K1	Detector RF Filter	100MMF, 100MMF, 47K		Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-97-1 PC-50 111TM1 1403-01 D-1

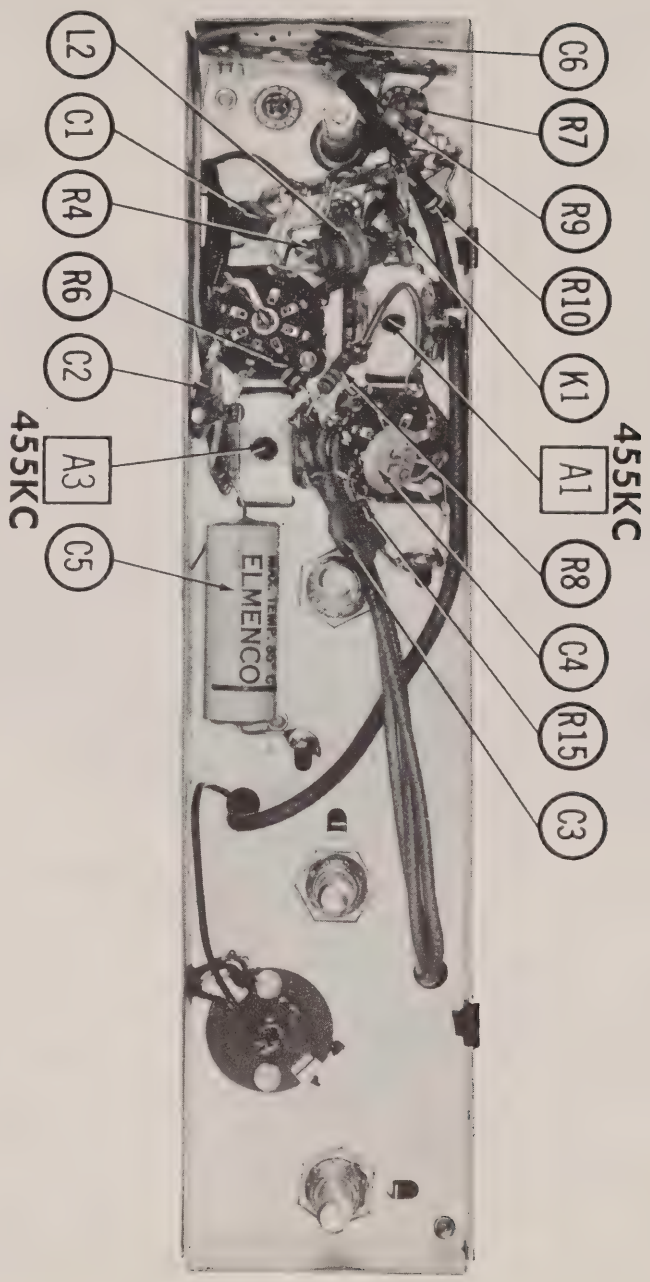
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MAGNAVOX PART No.	CBS PART No.	SYLVANIA PART No.	
M1	1N34A	530049-1	1N34A	1N34A	Audio Det (Clip in)

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M2	Tuning Cap.	260139-1	2 Gang (Ant. 23-390MMF, Osc 15-105MMF)

CHASSIS—BOTTOM VIEW



MAGNAVOX
CHASSIS CR-740AA

PARTS LIST AND DESCRIPTIONS

SILVERTONE
MODEL 7038 (Ch. 528.47500)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AT6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	18-12-2	PRS150V3050	BBRD5315	WD210	TDLD-8	MTD-301	TVA-2450
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	470	600	17-47115							
C3	.05	400	16-50343	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C4	47		15-47016	N750-SI 47	TCN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	N750
C5	.05	400	16-50343	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C6	470	600	17-47115							
C7	.05	400	16-50343	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C8	.0047	600	16-47253	BPD-0047	DD-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	Note 1
C9	.0047	600	16-47253	BPD-0047	DD-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C10	.05	400	16-50343	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C11	.05	400	16-50343	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	

Note 1. Not used in Model 7040.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	24-246	B-70	A47-1Meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2A	1Meg	½	24-245	B-69	A47-1Meg-S	Q11-137	U54	Tone Note 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

Note 1. Not used in Model 7040.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

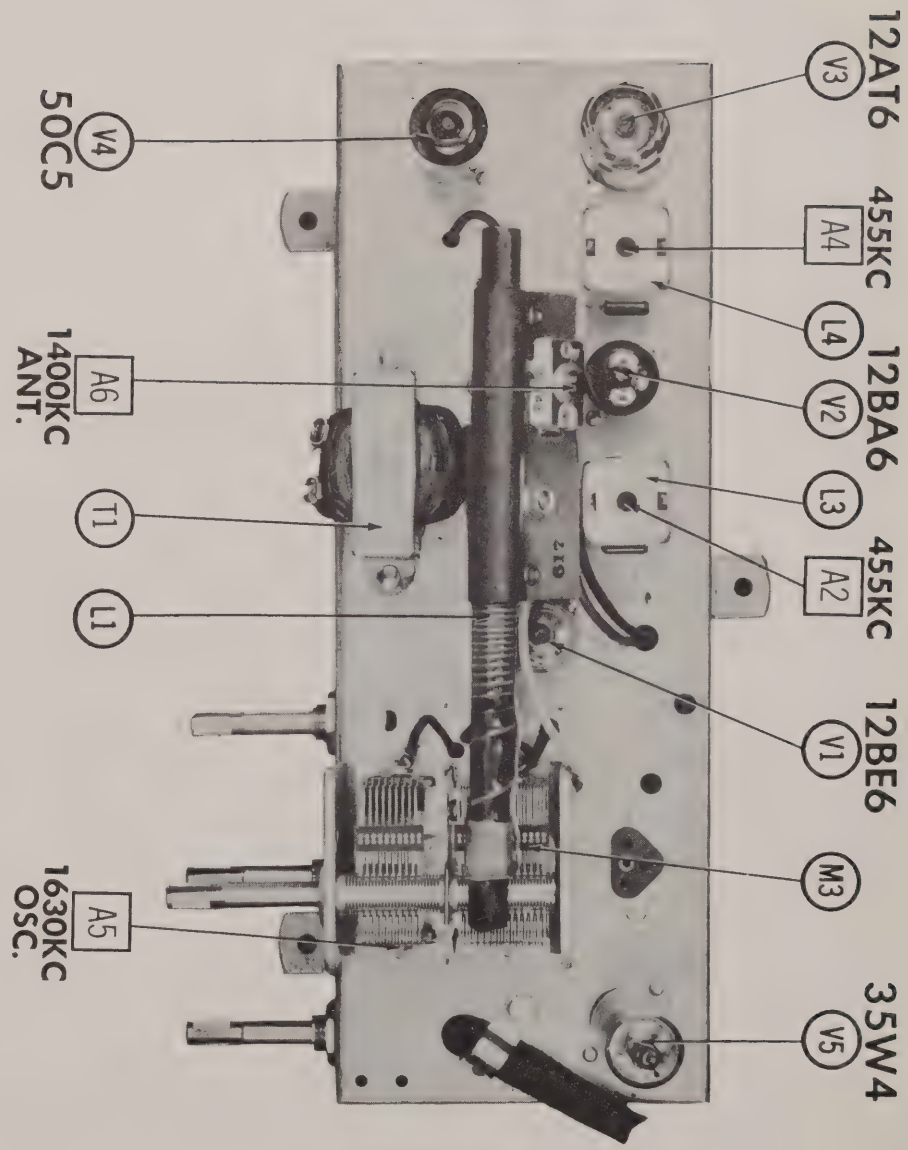
ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	IRC PART No.	NOTES
R3	2.2Meg		60-22502	BTS-2.2Meg	
R4	22K		60-22302	BTS-22K	
R5	2.2Meg		60-22502	BTS-2.2Meg	
R6	82Ω			BTS-82	Note 1
R7	47K		60-47302	BTS-47K	
R8	180Ω		60-18101	BTS-180	
R9	27Ω		60-27001	BTS-27	
R10	1000Ω	2	60-10211	BTS-1000	

Note 1. Some versions may use 150Ω in this application (Part #60-15101).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2900Ω	1.6Ω	80-383 ① 80-398 ②						① Used in Model 7038. ② Used in Model 7040.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	3½"	PM	3-4Ω	013094 ①②	3A07	① Parallel and Phase.
SP2	4"	PM	3-4Ω	011870 ①②	4A06	② Used in Model 7038.
	4"	PM	3-4Ω	79-441 ③	4A07	③ Used in Model 7040.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	82-107				Includes 22-110MMF Trimmer
L2	Osc. Coil	10-645	14-1074			Model 7038
	Osc. Coil	10-1-4	14-1074			Model 7040
L3	Input IF	10-508	16-6758	BC-352	12-C1	Model 7038
	Input IF	10-42-2	16-6758	BC-352	12-C1	Model 7040
L4	Output IF	10-479	16-6758	BC-353	12-C2	Model 7038
	Output IF	10-41-2	16-6758	BC-353	12-C2	Model 7040

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	Audio Coup. Net.	2000MMF, 5000MMF, 220MMF, 250MMF, 220MMF, 10Meg, 470K, 470K	71-112 ①	Centralab PC-159

① Part #13-10-3 used in Model 7040.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	SILVERTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	720088	66-2	K-AG-J	52-2	PFT-1	Model 7040
	720060	51-2	G-AG	52-2	PFT-1	Model 7038

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SILVERTONE PART No.	JENSEN PART No.	WALCO PART No.	
M2	72011	* A-762 or † A-672 or ♦ A-672D	† W-39MGS or ♦ W-39MGD	Model 7040
	720063	* S-652 or † S-642 or ♦ S-642D	* W3AGA or † W3AGS or ♦ W3AGD	Model 7038

* Metal † Jewel ♦ Diamond

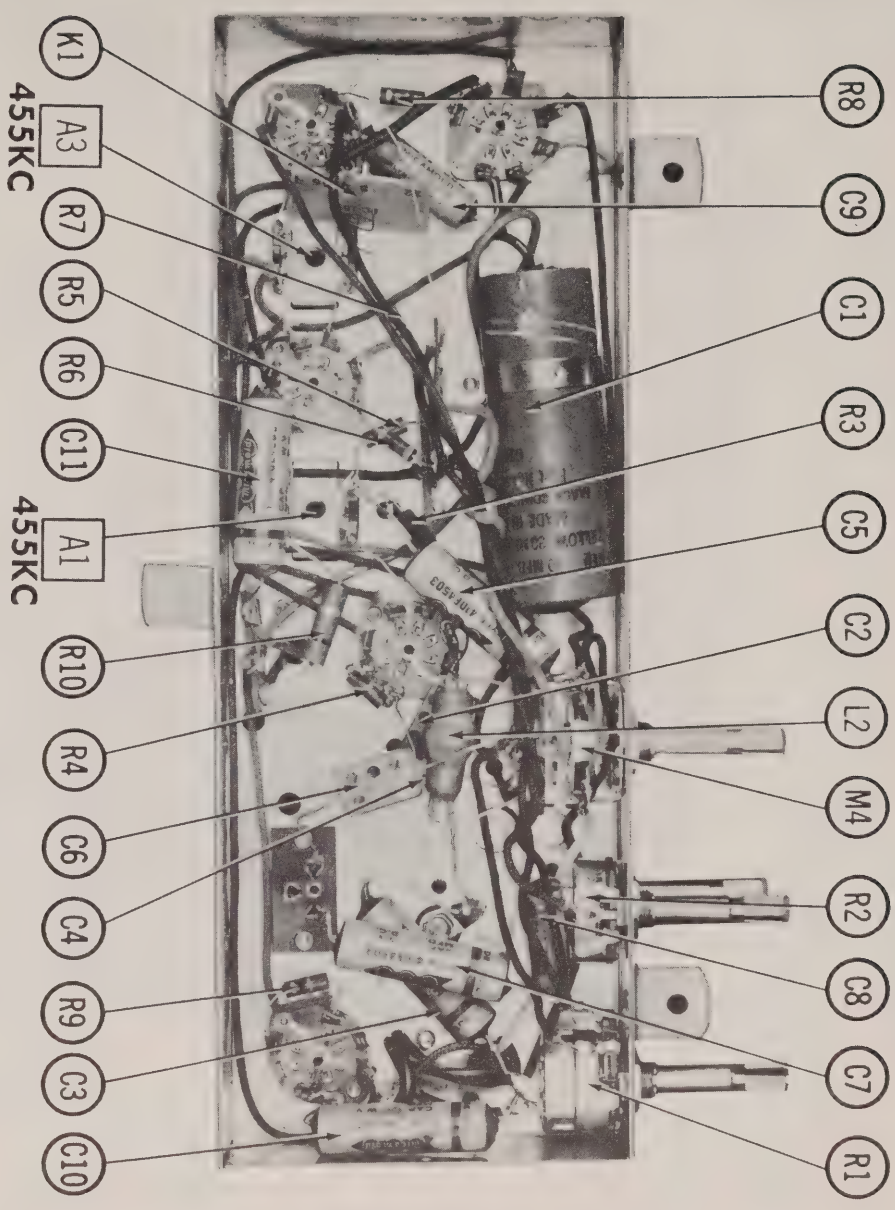
MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuning Cap.	19-255	2 Gang (Ant. 12-465MMF, Osc. 28-195MMF) Model 7038.
	Tuning Cap.	19-46-2	Model 7040
M4	Switch	69-216	Radio-Phono (Rotary, Wafer Type)

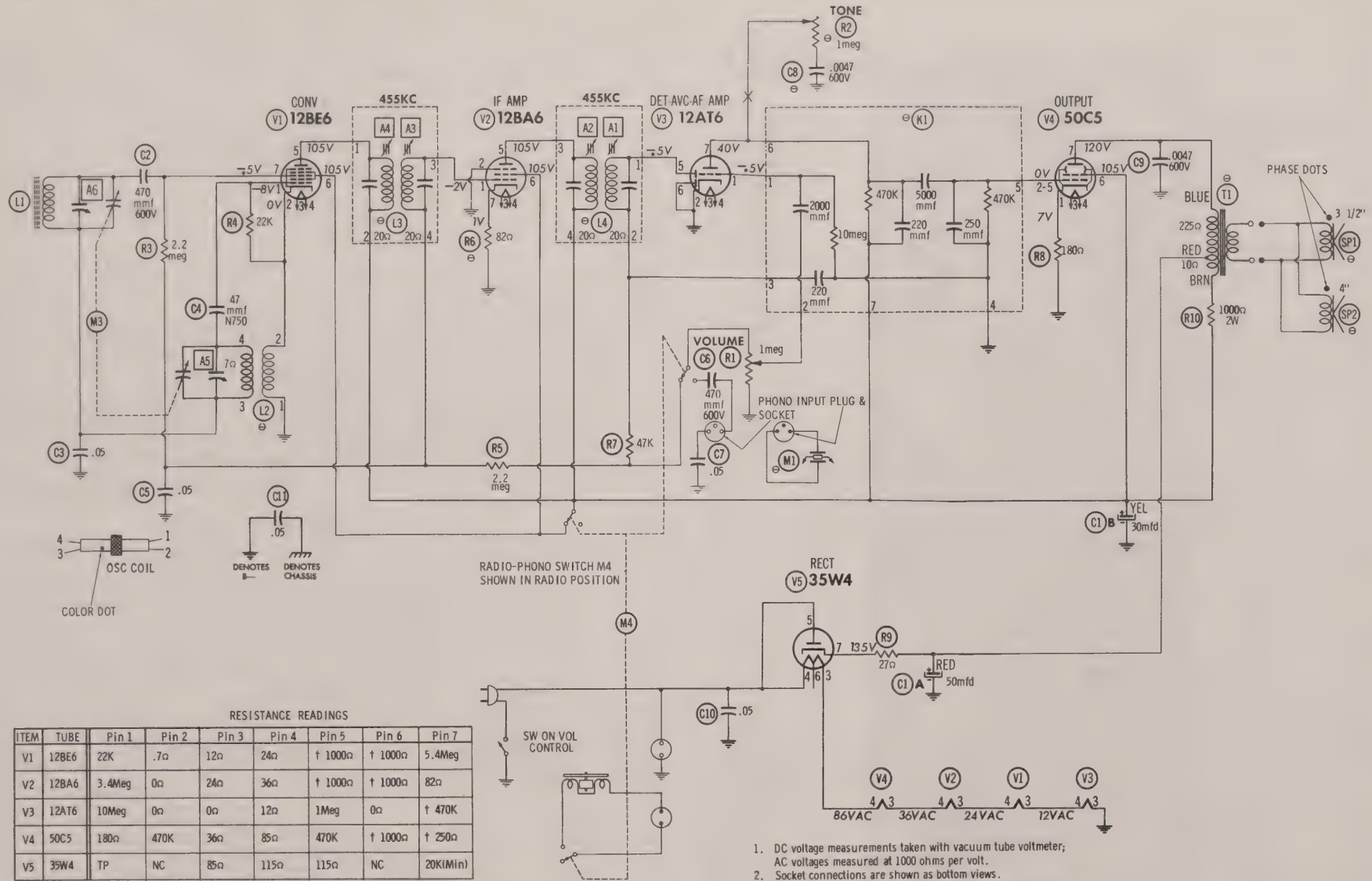
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

CHASSIS—BOTTOM VIEW



SILVERTONE
MODEL 7038 (Ch. 528, 47500)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.7Ω	12Ω	24Ω	† 1000Ω	† 1000Ω	5.4Meg
V2	12BA6	3.4Meg	0Ω	24Ω	36Ω	† 1000Ω	† 1000Ω	82Ω
V3	12AT6	10Meg	0Ω	0Ω	12Ω	1Meg	0Ω	† 470K
V4	50C5	180Ω	470K	36Ω	85Ω	470K	† 1000Ω	† 250Ω
V5	35W4	TP	NC	85Ω	115Ω	115Ω	NC	20K(Min)

† MEASURED FROM PIN 7 OF V5
TP TIE POINT
NC NO CONNECTION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

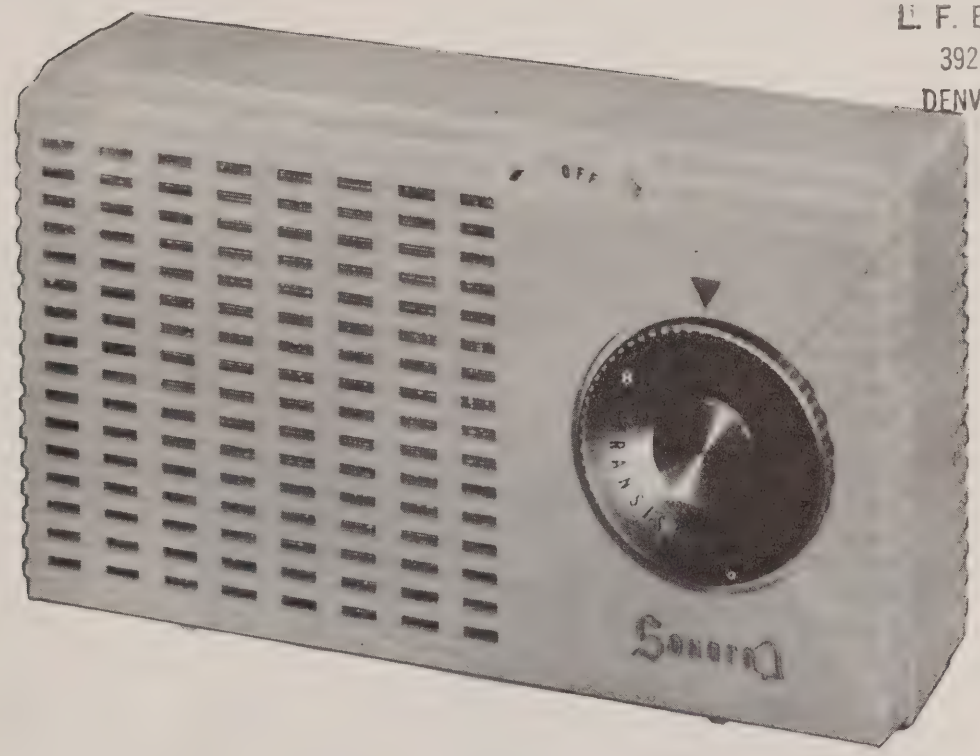
PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

SONORA MODEL 610

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



SONORA MODEL 610

TRADE NAME	Sonora Model 610
MANUFACTURER	Sonora Radio & Tel. Corp., 325 N. Hoyne Ave., Chicago, Ill.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	13.5 Volts DC
RATING	8MA @ 13.5 Volts DC
TUNING RANGE—BROADCAST	540KC - 1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1650KC	"	"	A4	"
3.		"	1400KC	Tune to 1400KC signal	"	A5	"
4.		"	600KC	Tune to 600KC signal	"	A6	Adjust for maximum output while rocking tuning gang.

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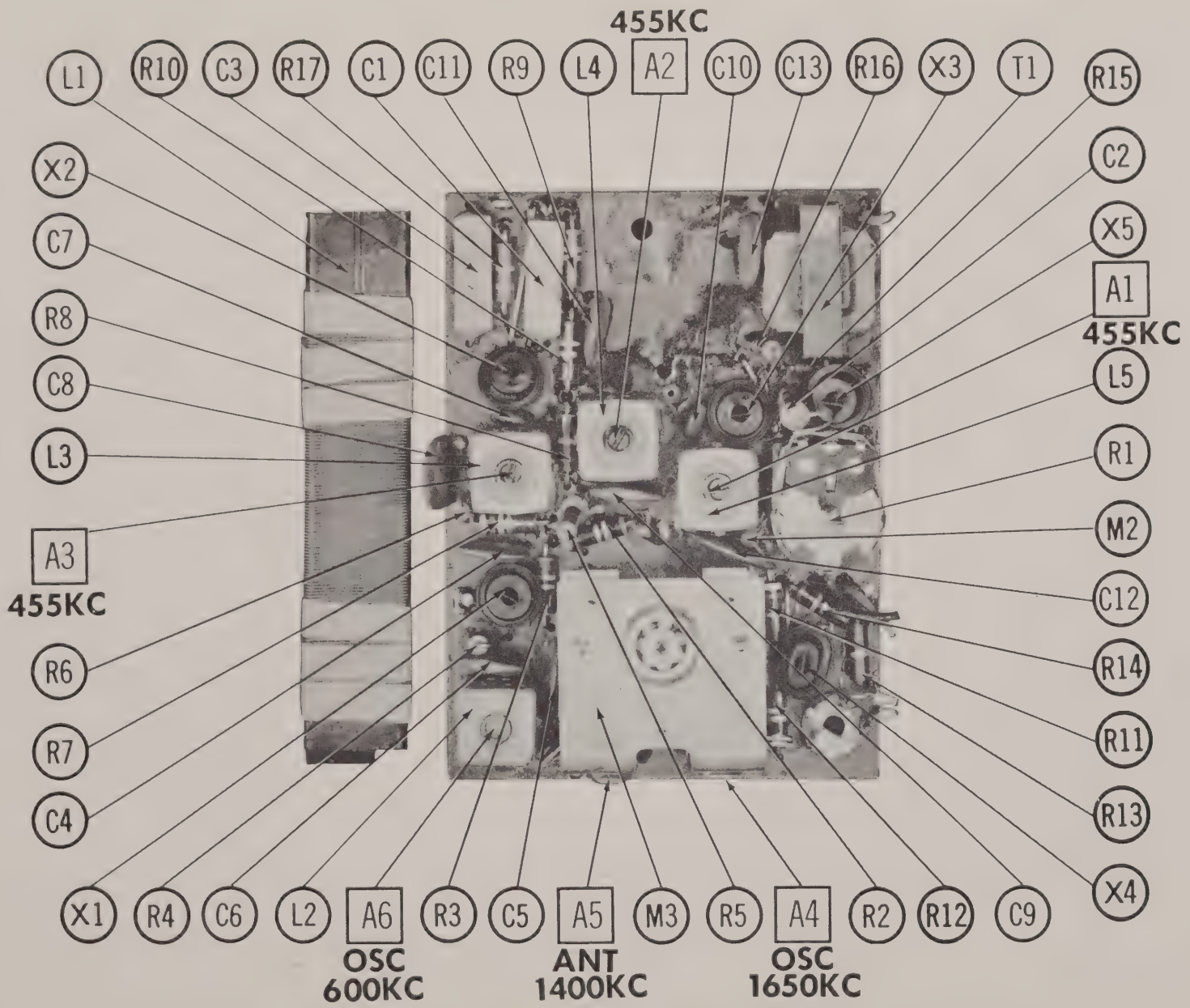
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N136	Converter				
X2	2N135	1st. IF Amplifier				
X3	2N135	2nd. IF Amplifier				
X4	2N169	AF Amplifier			2N94	
X5	2N44	Output				

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SONORA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	20	8		PWE10V20	NL20-6				
C2	7	8		PWE10V8	NL8-6				
C3	20	8		PWE10V20	NL20-6				

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	TG-S10	
C5	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	TG-S10	
C6	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	TG-S10	
C7	12				DD-120	L10Q12	ED-12		5GA-Q12	
C8	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	TG-S10	
C9	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	TG-S10	
C10	12				DD-120	L10Q12	ED-12		5GA-Q12	
C11	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	TG-S10	
C12	50000								TG-S50	
C13	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	TG-S10	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SONORA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2000Ω	1/4	R-2505					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R2	10K			BTS-10K	
R3	62K			BTS-82K	
R4	2200Ω			BTS-2200	
R5	6800Ω			BTS-6800	
R6	10K			BTS-10K	
R7	470K			BTS-470K	
R8	2700Ω			BTS-2700	
R9	12K			BTS-12K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R10	220K			BTS-220K	
R11	4700Ω			BTS-4700	
R12	22K			BTS-22K	
R13	2200Ω			BTS-2200	
R14	100K			BTS-100K	
R15	2200Ω			BTS-2200	
R16	56K			BTS-56K	
R17	2700Ω			BTS-2700	

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SONORA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3600Ω	16Ω	R-2497	GH9 ①					① Remove channel mounting frame.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SONORA PART No.	QUAM PART No.	
SP1	2 3/4"	PM	16Ω	R-2496		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick				2005	
L2	Osc. Coil					
L3	1st. IF		16-9003		2041	
L4	2nd. IF		16-9003		2041	
L5	3rd. IF		16-9004		2042	

BATTERIES

ITEM No.	VOLTAGE	SONORA PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	13.5V			XX9		239		M-1900		1900	

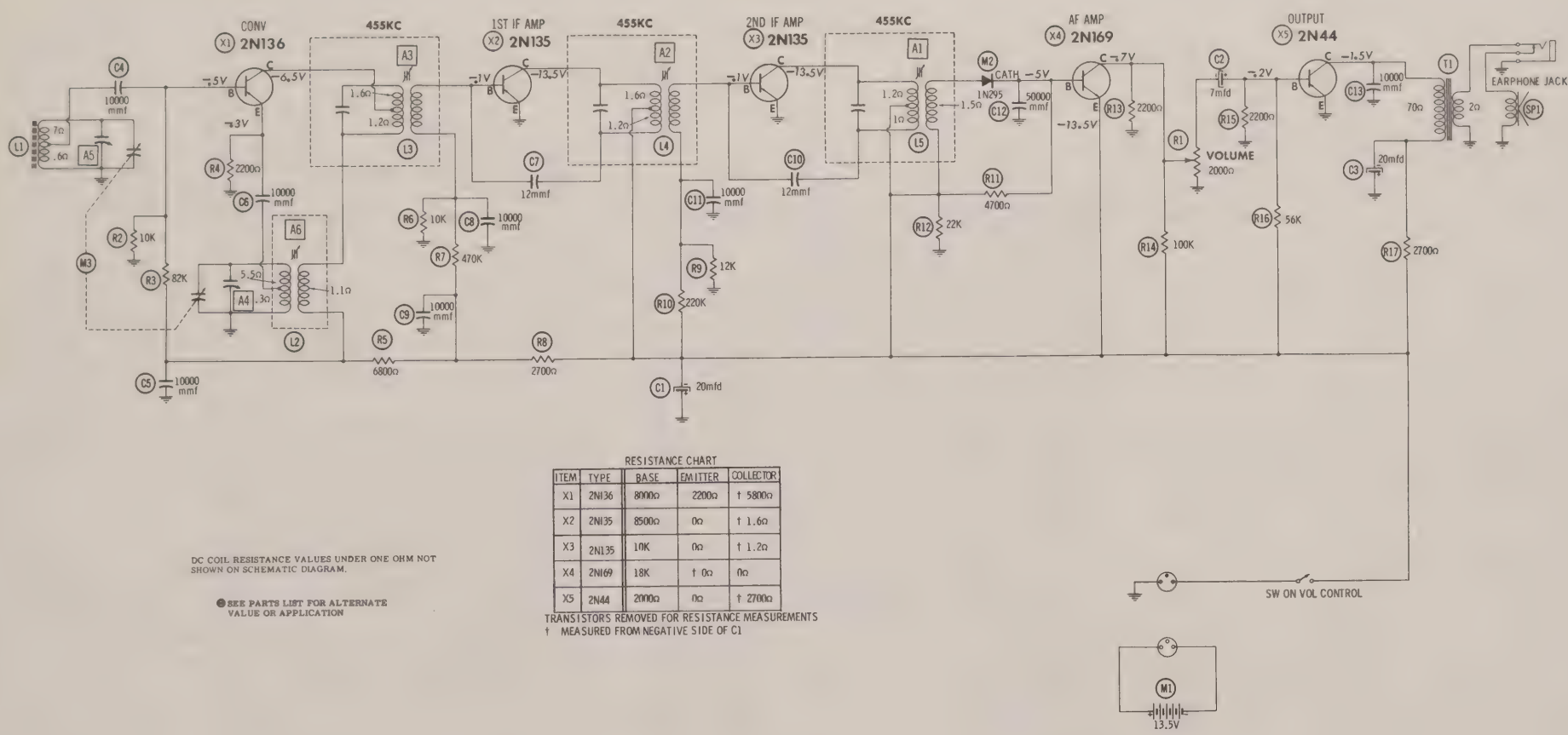
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SONORA PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N295		1N60	1N34A	Audio Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M3	Tuning Cap.	R-2506	2 Gang (Ant. 10-135MMF)

SONORA MODEL 610



RESISTANCE CHART

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N136	8000Ω	2200Ω	† 5800Ω
X2	2N135	8500Ω	0Ω	† 1.6Ω
X3	2N135	10K	0Ω	† 1.2Ω
X4	2N169	18K	† 0Ω	0Ω
X5	2N44	2000Ω	0Ω	† 2700Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS
† MEASURED FROM NEGATIVE SIDE OF C1

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

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*TRADE MARK

RETMA MEMBER

SYLVANIA
MODEL 4403 (Ch. 1-614-1)

SYLVANIA
MODEL 4403 (Ch. 1-614-1)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

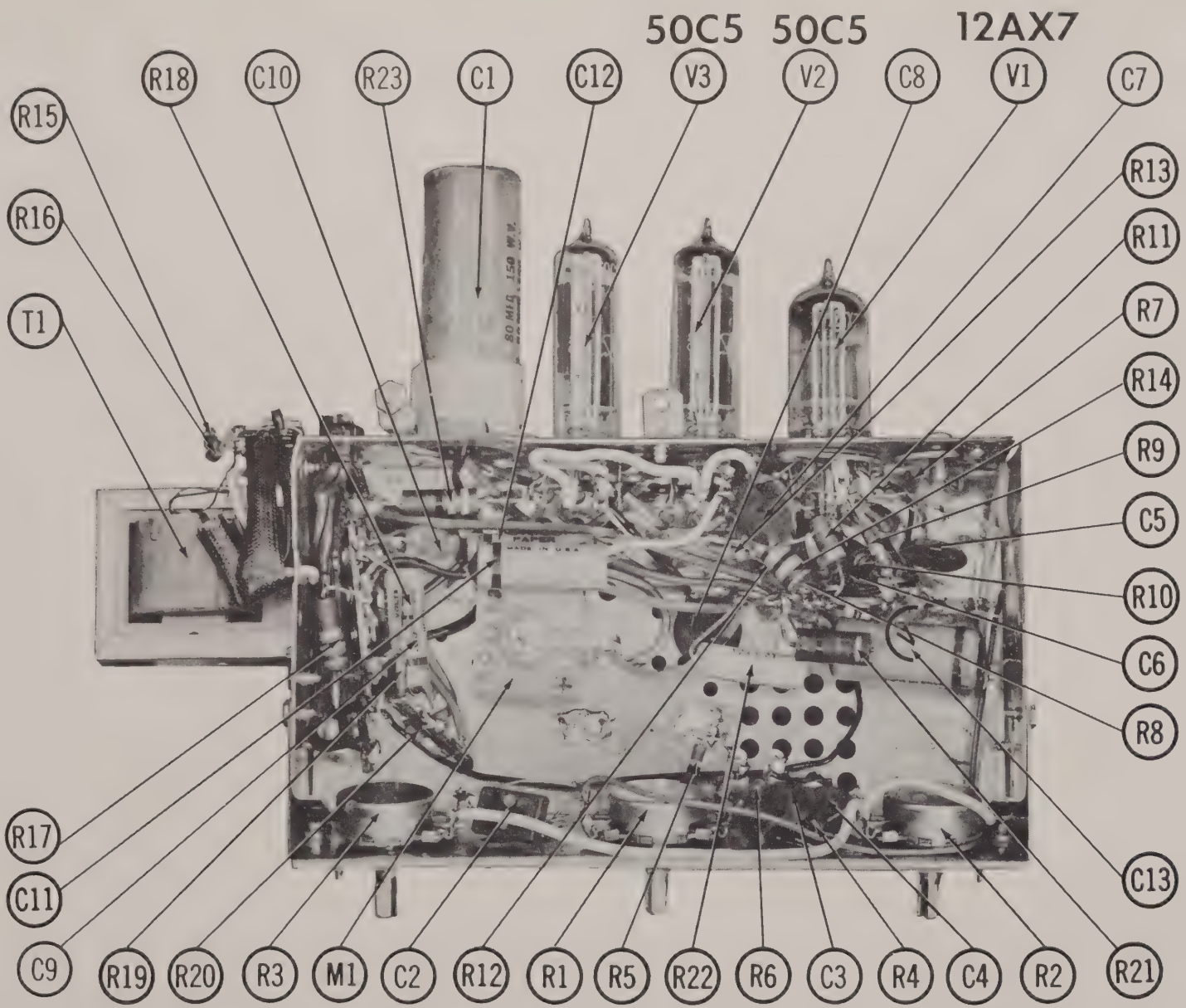
SYLVANIA
MODEL 4403 (Ch. 1-614-1)

TRADE NAME	Sylvania Model 4403 (Ch. 1-614-1)
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & Tel. Div., 700 Ellicott St., Batavia, N. Y.
TYPE SET	AC Operated Audio Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AX7 AF Amplifier, (2) 50C5 Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .32 Amp. @ 117 Volts AC, 30 Watts (Without Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER 1-317-1 — SEE SIMILAR V-M MODEL 1200A — PHOTOFACT SET 353 FOLDER 16

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



CHASSIS-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AX7	
V2	Output	50C5	
V3	Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	161-2019	PRS150V8050	BBRD8515	TCD498	TDLD-12	D-085	TVA-2462
B	50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	470		166-0470N	1468-00047	D6-471	1W5T47	ED-470	UC-5347	1FM-347	
C3	3000		166-3300P	BPD-003	D6-302	BYA10D3	ED-003	UC-523	5GA-D3	
C4	3000		166-3300P	BPD-003	D6-302	BYA10D3	ED-003	UC-523	5GA-D3	
C5	10000		168-0020	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	10000		168-0020	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	10000		168-0020	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C8	10000		168-0020	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C9	.05	200	160-06147	BPD-05	DF-503	CUB4S5		GEM-215	4TM-S5	
C10	5000		166-5000D	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C11	.01	600	160-0611	BPD-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C12	.01	600	160-0611	BPD-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C13	.1	400	160-0601	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	3Meg	½	153-0128					Loudness, Tap ② 1Meg & 2Meg
B	Shaft							
R2A	5Meg	½		AB-88	A47-5Meg-Z	Q12-141	U65	Bass (Note 1)
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R3A	250K	½	153-0126	B-50	A47-250K-S	Q11-130	U46	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

Note 1. Some versions may use 470K (Part #153-0127)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R4	100K		181-0104	BTS-100K	
R5	100K		181-0104	BTS-100K	
R6	100K		181-0104	BTS-100K	
R7	10Meg		181-0106	BTS-10Meg	
R8	8.2Meg			BTS-8.2Meg	Note 1
R9	270K 5%		181-0274	BTS-270K 5%	
R10	270K		181-0274	BTS-270K	
R11	47K		181-0473	BTS-47K	
R12	470K		181-0474	BTS-470K	
R13	470K		181-0474	BTS-470K	
R14	100Ω	1	182-0101	BTA-100	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R15	100K		181-0104	BTS-100K	
R16	4700Ω		181-0472	BTS-4700	
R17	11K 5%	1		BTA-11K 5%	Note 2
R18	10K		181-0103	BTS-10K	
R19	5.6Meg 5%			BTS-5.6Meg 5%	Note 3
R20	5.6Meg 5%			BTS-5.6Meg 5%	Note 3
R21	1000Ω	2		BTB-1000	Note 4
R22	50Ω	5	187-0050	PW7-50	
R23	47Ω	1	182-0470	BTA-47	

Note 1. Some versions may use 10Meg (Part #181-0106) in this application.
Note 2. Some versions may use 10K, 1W (Part #182-0103) in this application.
Note 3. Some versions may use 6.8Meg (Part #181-0685) in this application.
Note 4. Some versions may use 1W (Part #182-0102) in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3600Ω CT	3-4Ω Tap ③ 1.6Ω*	143-0058	Z1000	A-2900	A-3856	24S60	S-51X	* 1.6Ω Tap not used.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP1 SP2	8"	PM ①	3-4Ω	539-0808 538-0001	8A3IR	① Electrostatic Type

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SYLVANIA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.090A	517-0016	1005A	RS150	6S150	150	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	SYLVANIA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2	916-0006	118-TS	N8-1 N8-3	56	PT-1	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SYLVANIA PART No.	JENSEN PART No.	WALCO PART No.	
M3	902-0006 (78RPM)	† CRA-55 or ♦ CRA-55D	† W-64S	† Jewel ♦ Diamond
	902-0007 (16-33 1/3-45RPM)	† CRA-55LP or ♦ CRA-55LPD	† W-64MGS	

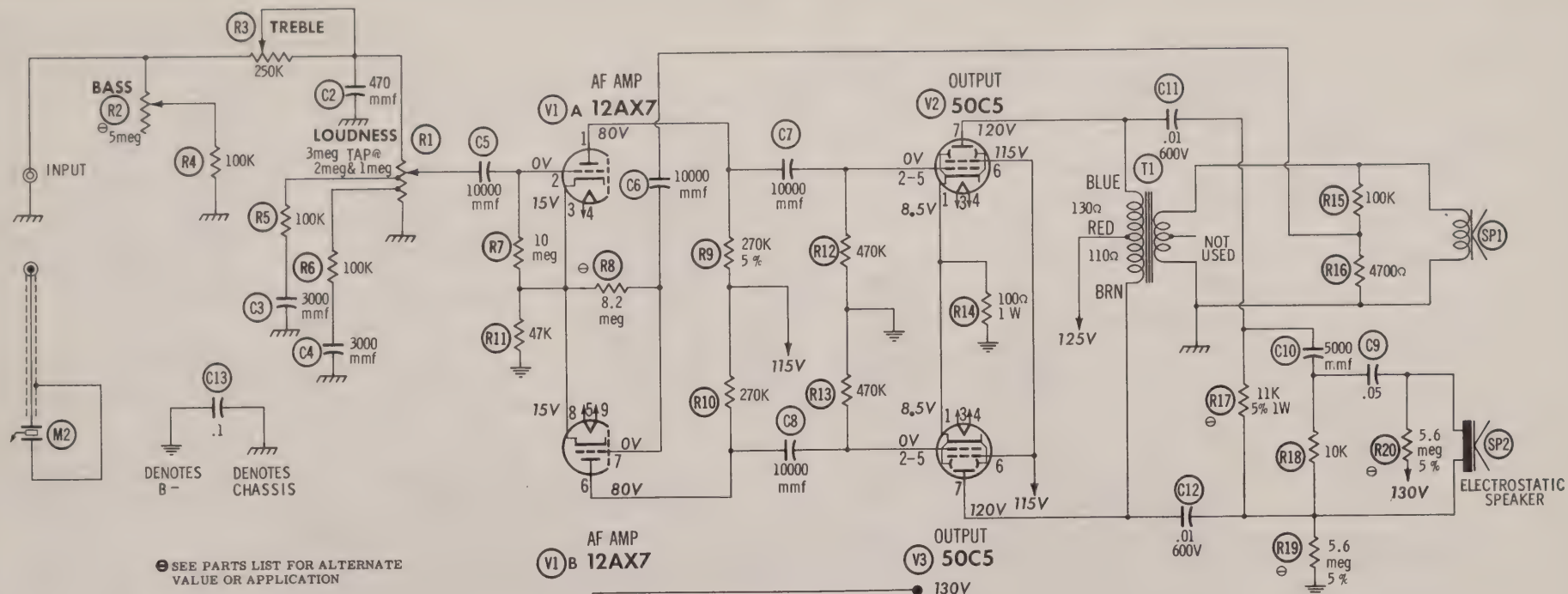
MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M4	Switch	571-0005	Off-On-Reject
M5	Motor	924-0007	Phono

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	742-0013	On-Off-Reject, Speed Selector
Knob	954-0008	Needle Selector
Knob	740-0152	Loudness, Treble, Bass



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	† 270K	10Meg	47K	0Ω	12Ω	† 270K	8.2Meg	47K	6Ω
V2	50C5	100Ω	470K	12Ω	62Ω	NC	† 1000Ω	† 180Ω		
V3	50C5	100Ω	470K	62Ω	112Ω	NC	† 1000Ω	† 160Ω		

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.

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RETMA MEMBER

WEBCOR
MODELS 151, 152

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

WEBCOR
MODELS 151, 152

WEBCOR
MODELS 151, 152

GENERAL INFORMATION

Webcor Record Changer Models 151 and 152 are designed to play and automatically change a 1 inch stack of 7", 10", or 12" records, which (providing they are of the same speed and same type of groove) may be intermixed in any order.

The Model 152, in addition to the above features, contains the new Automatic Speed Change provisions for switching the turntable to the correct speed and adjusting the tone arm to the correct set down position when 33 1/3 and 45 r.p.m. records are intermixed in one stack.

Turntable Speed ---------- 16, 33 1/3, 45 or 78 R.P.M.
Record Capacity ---------- 1 Inch Stack of 7", 10" Or 12", Records

A single control knob is used to select the desired turntable speeds, initiate a change cycle, and disengage the idler wheel while unit is not in use to prevent the formation of flat spots on the idler surface. The center spindle incorporates a safety pawl which prevents records from dropping to the turntable while the tone arm is in playing position.

Models 151 and 152 were designed to operate on 105 to 120 volts, 60 cycle A.C. only.

MANUFACTURED by:

WEBCOR
5610 Bloomingdale Ave.
Chicago 39, Illinois

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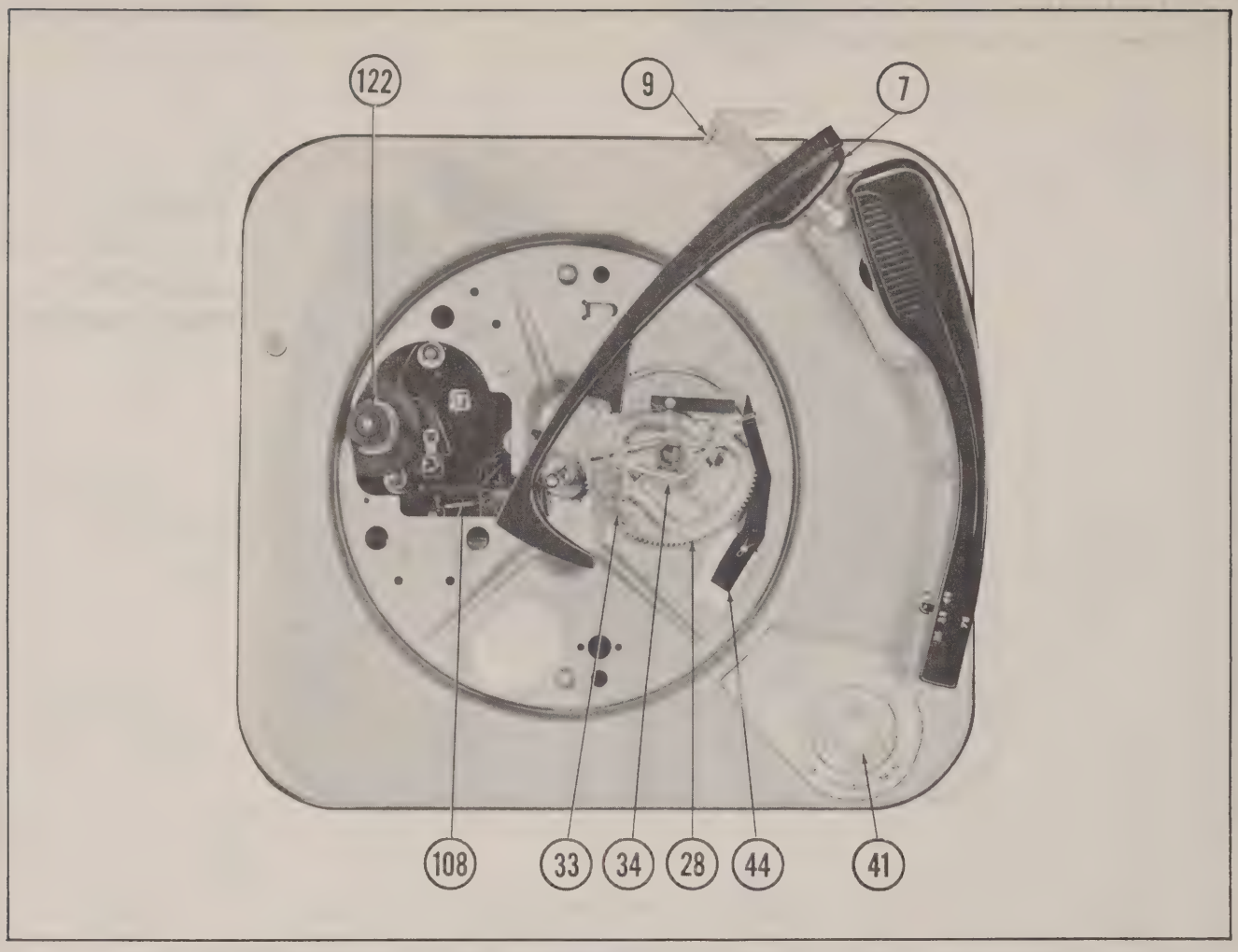


Figure 1

Preparing For Operation

Before placing in operation, the changer must be floating freely on its mounting springs. During shipment, the unit is secured by means of two shipping screws (one screw at the front and rear edge of the baseplate). Carefully remove cardboards which protect unit during shipment. Turn the two shipping screws in a clockwise direction until they are flush with the baseplate. The changer is now free-floating and ready for operation.

Operating Instructions

1. Release the tone arm from the tone rest.
2. Raise the front of the tone arm and remove the needle guard.
3. Lift record overarm and turn away from spindle until it locks in open position.
4. Place up to a 1" stack of records on the spindle. 7", 10", and 12" records may be intermixed so long as they are of the same speed.
5. While holding the records in place with one hand, swing record overarm toward spindle and lower it over the records.
6. Turn needle selector on tone arm to correct position for 16-33-45, or 78 R. P. M.
7. Turn the speed control to the speed which corresponds to the type records to be played, 16, 33, 45, or 78 R. P. M.
8. Depress the combination speed and reject control. Each record in the stack will play and be automatically changed until the last record is played, at which time, the tone arm returns to its rest position and the changer automatically shuts off.
9. To remove records, lift record overarm and swing away from spindle until it locks in open position using both hands, with fingers under the edge of bottom record, lift records straight up and off spindle.

Note: When the changer is not in use, be sure the the selector knob is in its neutral (N) position.

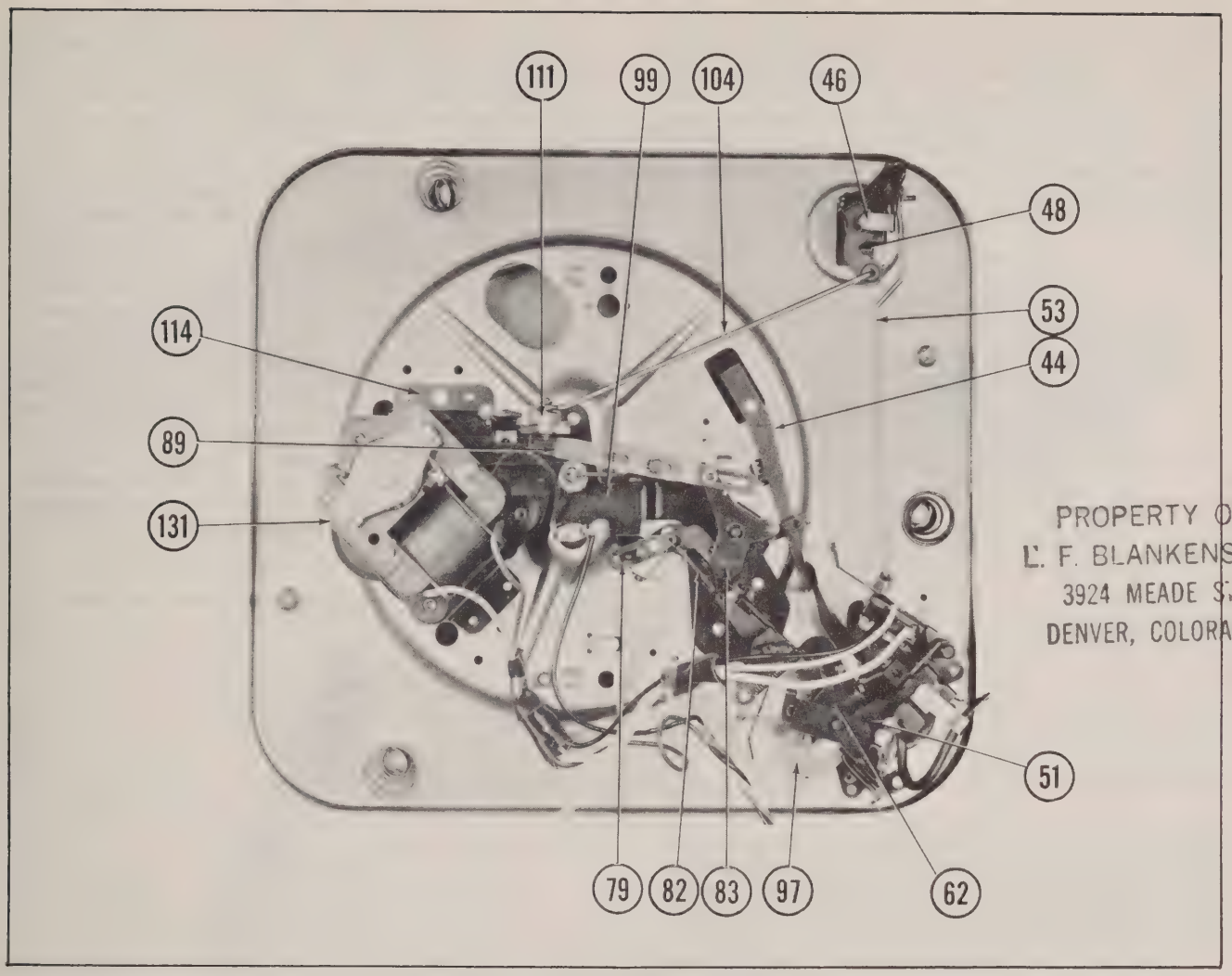
Change Cycle

Speed Change Mechanism —

The changer mechanism is driven by the motor (131) which transmits power to the turntable by means of idler wheel (122). Turntable speed is determined by the position of the wheel on one of the four steps of the drive shaft (129). When the Selector-Reject Knob is turned to the "16" position, the idler wheel contacts the smallest diameter portion of the drive shaft. As the idler wheel is lowered so that it is contacted by increasingly larger drive shaft diameters, it turns at faster speeds.

Starting The Motor And Change Cycle —

Line voltage is applied to the motor through the plunger-operated misroswitch (65). When the plunger is depressed, the switch is open, and the motor is not energized. When the plunger is released, the motor



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DENVER, COLORADO

Figure 2

is engerized and the turntable will be driven by idler wheel (122).

When the reject knob (41) is depressed, the reject rod (53) moves the microswitch (65) from under the shutoff plate (59). This releases the switch plunger and closes the a-c circuit which energizes the motor and starts the turntable rotating.

Simultaneously, the flexible metal bar on switch bracket (64) contacts and applies pressure to the portion of trip bracket (44) which extends below the baseplate. This action causes the portion of trip bracket (44) which extends above the baseplate to contact and move the slide plate (34) in toward the spindle. This in turn, causes the projection on the hub of the turntable to contact the front edge of slide plate (34). Since the turntable is rotating, the contact between the front edge of slide plate (34) and turntable hub projection gives the necessary push for the teeth in main gear (28) to engage the teeth in the turntable hub, thus causing main gear (28) to rotate.

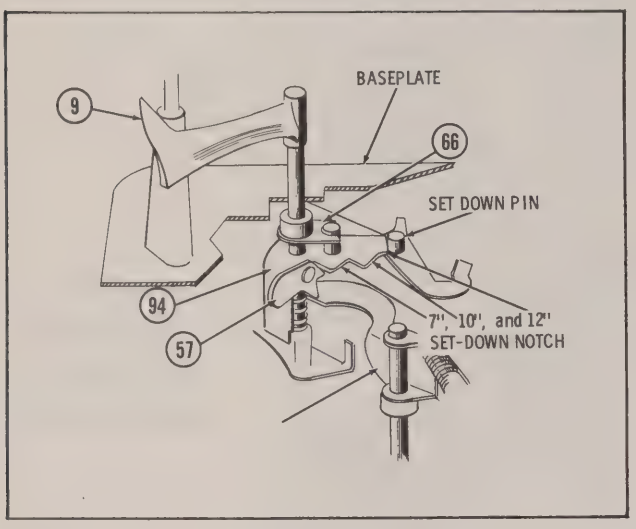
As main gear (28) starts its rotation, the stud on the end of raising lever (62) engages an eccentric groove in the underside of main cam (28). The motion imparted to the raising lever (62) by the eccentric groove causes the rear end of raising lever (62) to pivot upward and contact the lift plate (61). In turn, the lift plate friction pad lifts the shutoff plate (59), which raises the tone arm off its rest. As the shutoff plate (59) is raised, it clears the microswitch plunger and permits the microswitch and switch bracket (64) to be returned to their original position by action of torsion spring (54).

As the stop plate (59) raises, the bottom tooth on the bottom of record selector bracket pawl (57) engages a hook on the raising lever (62), so that pawl (75) and record size bracket (94) will follow the motion of raising lever (62).

At this time, the eccentric groove in the bottom of main cam (28) causes the rear end of raising lever (62) to pivot. As a result, stop plate (59) and record size bracket (94) are simultaneously rotated counterclockwise. During this rotation, the set down pin (located on top of the shutoff plate) swings clear of the record size bracket (94) and the shutoff plate (59) until the bracket stop ear (94A) hits the tone arm bracket (51). Consequently, the raising lever (62) moves out from under the record selector pawl (57) and the record size bracket (94) is permitted to drop. This brings the notched plate, located on the top of record size bracket (94), directly in line with the set down pin which is located on top of shutoff plate (59). As a result, the inward swing of the tone arm (toward the spindle) is stopped at the point where the set down pin contacts the notched plate. The exact position of the tone arm set down depends upon the particular record size bracket notch (94) engaged by the set down pin. This, in turn, is determined by the size of the bottom record on the spindle.

After the tone arm lands on the record and the mechanism reaches it out of cycle position, the veloc-

ity trip arm (58) moves inward toward the trip bracket (44) as the tone arm tracks toward the spindle. Near the end of the record the velocity trip arm (58) actually contacts the trip bracket (54), but velocity is insufficient to cause slide plate (34) to engage the turntable gear. When the tone arm follows the eccentric groove at the end of the record the movement of the velocity trip arm (58) increases and sufficient velocity for tripping action is applied to the slide plate (34).



Record Size Selection —

As the record size bracket (94) rotates at the beginning of the change cycle, the pin on top of bracket (94) rides within the fork of the semaphore link (66) and causes semaphore (9) to swing toward spindle. When pawl (57) disengages from raising lever (62), the record size bracket (94) drops so that its 7 inch set down notch is in position to block the set down pin which is located on top of shutoff plate (59). When the tone arm has reached its farthest outward travel, the bottom record will be pushed off the spindle shelf. If the record has a 7 inch diameter, it will clear the semaphore (9) as it drops to the turntable, and the porition of record size bracket (94) will not be changed. If, however, a 10 or 12 inch record drops off the spindle, it will hit against one of the sloping sides of the semaphore (9) and push it back toward its original position. A 10 inch record will push the semophore back approximately half way, while a 12 inch record will push it back to its starting place. This motion is transmitted to the record size bracket (94) and positions it to block the tone arm for the 10 or 12 inch set down point.

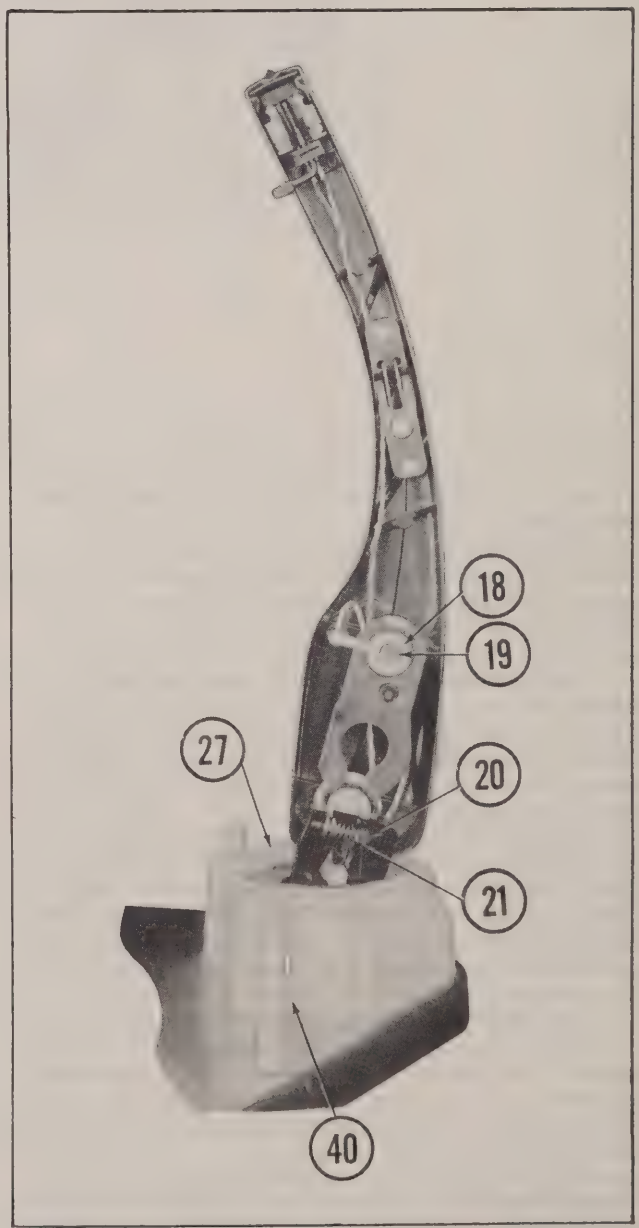
Record Push Off Mechanism —

The record push-off mechanism consists of a pre-assembled spindle (6) and a spindle lever and roller (101). The roller rides on the cam surface on the bottom of the main cam (28). As the main cam rotates, the roller is depressed, causing the opposite end of the spindle lever to force the spindle mechanism upward. When the spindle mechanism has reached its maximum upward position, the bottom record of the stack is pushed off the spindle and drops to the turntable.

Shut Off Operation After Last Record Is Played —

After the last record drops to the turntable, the overarm shaft depresses the lockout lever (97). This causes the lockout pawl (96) to be lowered until, after the last record has dropped, the bottom edge of pawl (98) is in a position to engage with the protrusion on the rear of shutoff plate (59) and prevent any inward motion of the shutoff plate during the change cycle. As a result, the tone arm will set down on the tone arm rest, causing the shutoff plate (95) to depress the switch plunger and shut off the motor.

The action of the pivot bracket lever (123) prevents the automatic shutoff operation before the last record has been played. While the last record of a stack is resting on the spindle shelf, the lock out lever (97) is held in a raised position by tension spring (72). As the changer goes into cycle, but before the last record is pushed from the spindle shelf, the pivot bracket lever (123) pivots under the lock out lever and prevents the weight of the overarm shaft from depressing lock out lever (97). After the last record has been played and the changer again goes into a change cycle, the weight of the overarm shaft depresses the lock out lever (97). In this position, the pivot bracket lever (123) pivots over the top of lock out lever (97) and permits the lock out pawl (96) to engage with the ear on shutoff plate (59) and block the inward movement of the tone arm.



TONE ARM ASSEMBLY

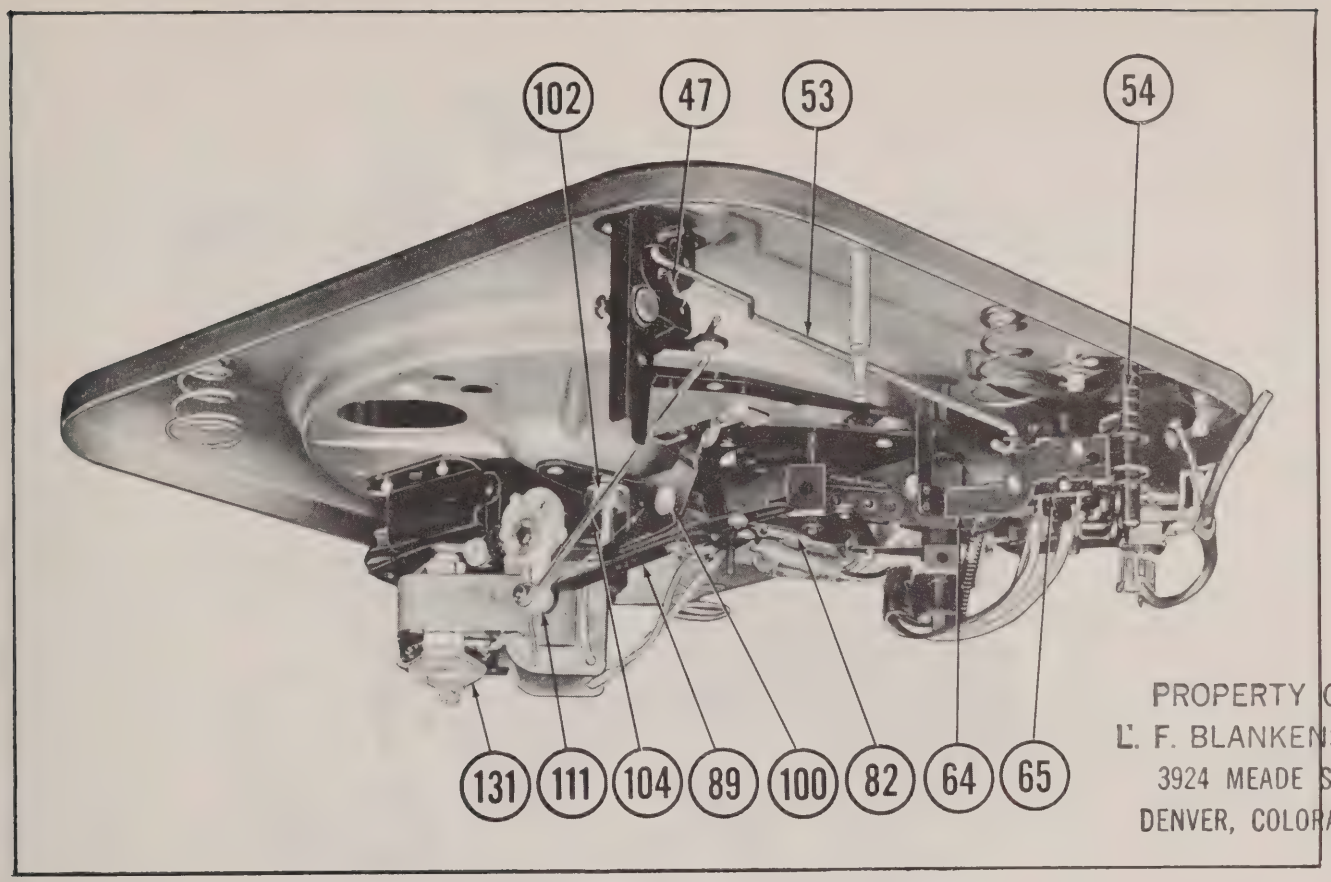


Figure 3

Adjustments

Tone Arm Shaft Assembly Adjustment —

The entire operation of the changer mechanism depends, to a large degree, upon the correct assembly of the tone arm shaft parts. Improper adjustment of these parts will indicate false symptoms elsewhere in the changer (i.e. height adjustment, indexing adjustment, etc.) when actually the trouble is caused by incorrect adjustment of the tone arm shaft and its associated parts.

Of the various parts assembled on the tone arm shaft (26), only the stop plate (59) is actually fastened to the shaft, with a #8 Bristol screw (60). As a result, any up and down or lateral movement of the stop plate is transferred to the tone arm. All other parts fit the tone arm shaft loosely and are permitted to rotate freely about the shaft.

The position and height at which the stop plate (59) is fastened to the tone arm shaft is of the utmost importance. Improper positioning of this assembly could result in no motor shutoff, incorrect tone arm set down, tone arm slide on record, no tone arm set-down on rest, continuous cycling, or any combination of these.

To simplify the correct positioning of stop plate (59), a small indentation has been drilled into the tone arm shaft. It is imperative that the set screw of the stop plate engage this indentiation and is securely tightened. With the stop plate so positioned, the occurance of any symptoms described above would be do to other causes.

Tone Arm Set-Down Adjustment —

Tone Arm set-down adjustment is required if indexing is correct (tone arm sets down in approximately the correct position for the record being played) but the needle does not land in the lead-in groove of the record. Adjustment is made by means of the set down adjusting screw (20) which is located in the tone arm hinge assembly. Adjust as follows:

1. With reject knob "N" position place a 7 inch record on the turntable and depress the reject knob.
2. Rotate the turntable by hand and observe the needle landing point.
3. If needle tends to set down outside of record, turn adjusting screw (20) counterclockwise to move tone arm toward spindle. If needle sets down too far toward the center of the record, turn screw (20) clockwise until the correct set-down point is obtained.

Stylus Pressure Adjustment —

Unless otherwise stated by the cartridge manufacturer, the stylus pressure should be between 8 and 11 grams for best results. Stylus pressure is adjusted by rotating the tone arm counterbalance stud (22). The stud can be rotated by inserting a small steel rod in the stud hole. Rotate the stud upward to decrease stylus pressure, or downward to increase stylus pressure.

Note: A slight movement of the stud has a relatively great effect on needle pressure. An accurate pressure gauge should be used to insure correct reading.

Semaphore Adjustment —

Adjustment of the semaphore (9) is required if it becomes necessary to replace the semaphore, if the semaphore link (66) has loosened during operation, or if erratic or improper indexing occurs. Adjustment

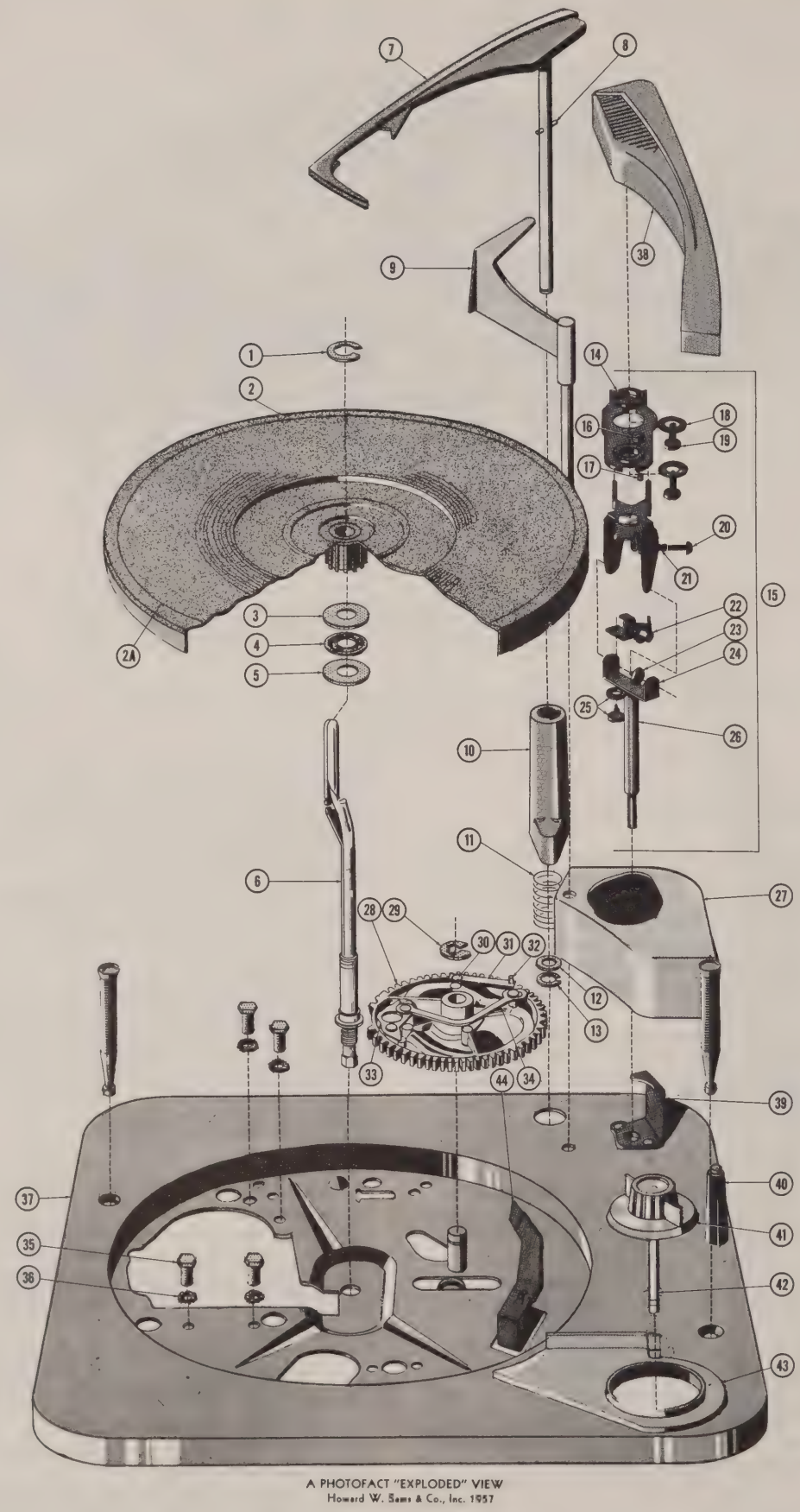


Figure 4A. Exploded View of Parts Above Baseplate

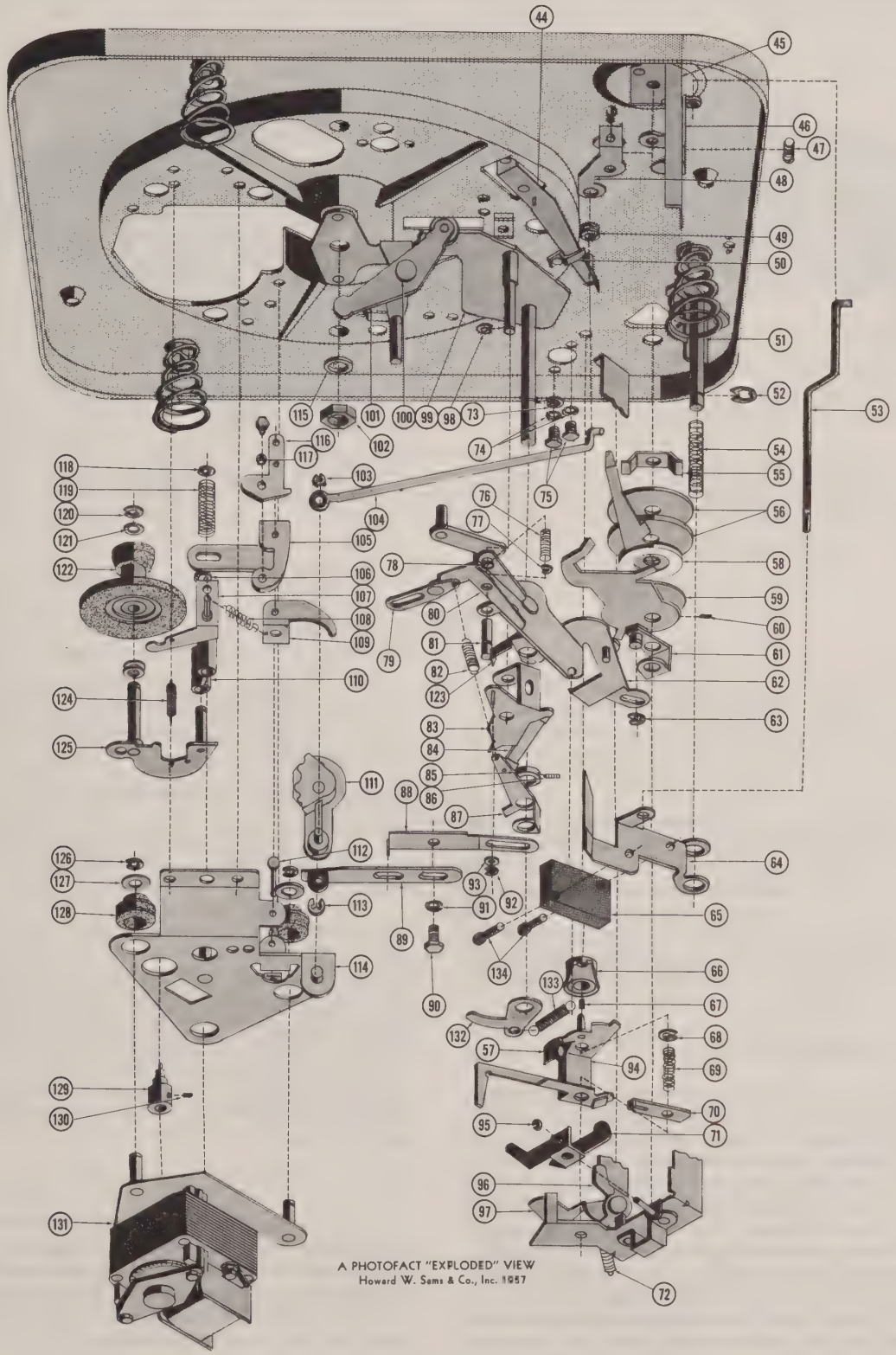


Figure 4B. Exploded View of Parts Below Baseplate

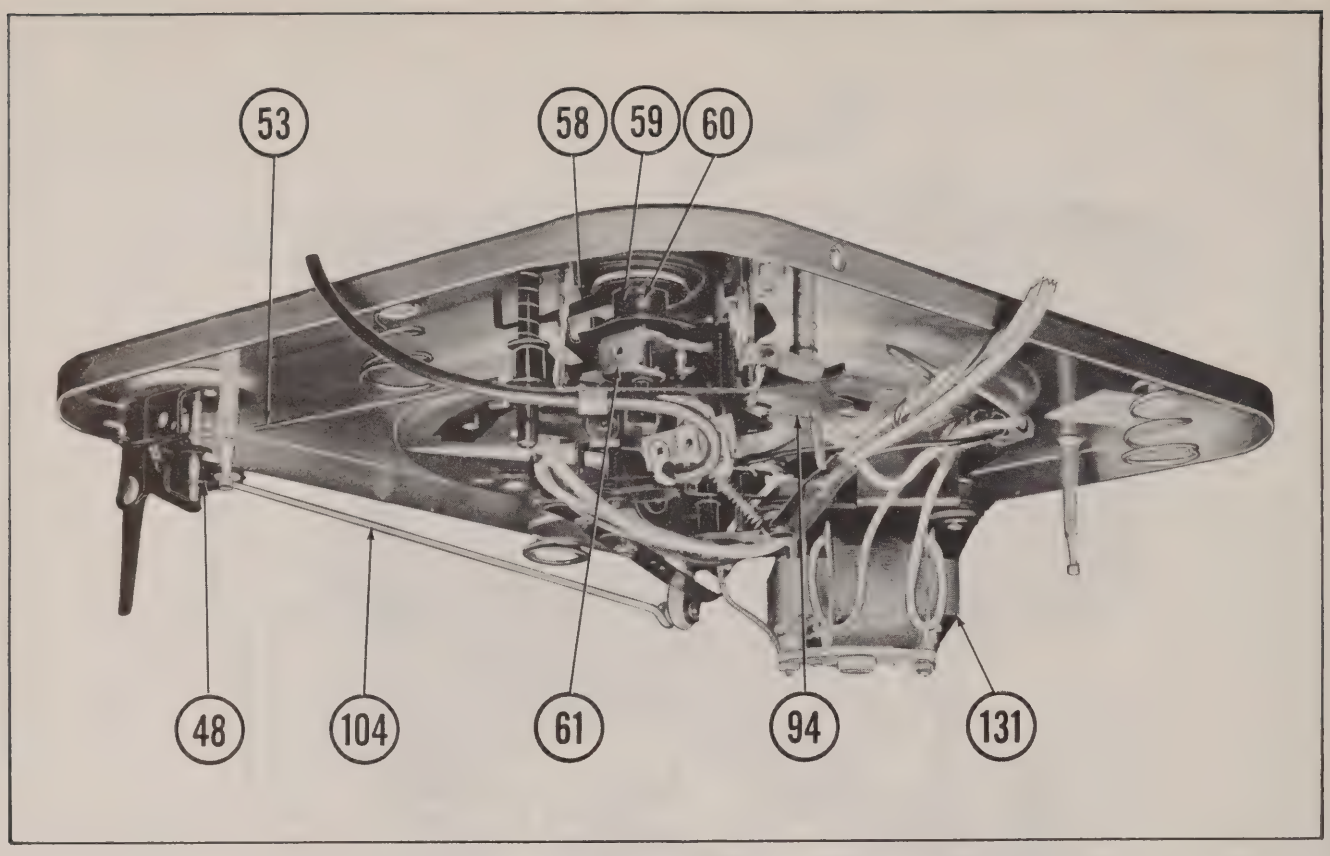


Figure 5

involves positioning of the semaphore link (66) on the shaft so that proper semaphore action is possible.

The link (66) is fastened to the semaphore shaft by means of set screw (67) which is accessable from the back of changer. Correct adjustment procedure is as follows:

1. Loosen set screw (67) and permit link (66) to drop until it rides on top of record size bracket (94).
2. With semaphore (9) hold firmly against the overarm housing (10), rotate record size bracket (94) clockwise as far as possible.
3. Lift semaphore link (66) until it is raised to within 1/64 inch of the underside of the main plate, and tighten set screw (67) securely so that link is fastened to semaphore shaft.

Velocity Trip Adjustment –

Improper adjustment of the velocity trip mechanism may result in failure of the automatic or reject trip lever to initate the change cycle, or could cause continuous cycling. To check this adjustment, or correct faulty adjustment, proceed as follows:

With tone arm on its rest, remove turntable and move slide plate (34) away from spindle as far as possible. Rotate trip bracket (44) until its bottom portion contacts the reject trip lever (64). In this position, the clearance between the top portion of trip bracket (44) and the slide plate lever (34) should be approximately 1/8 inch. If spacing is incorrect, bend the flexible portion of switch bracket (64) until proper clearance is obtained. Check trip bracket (44) to make sure that it does not rub against the main cam or baseplate.

To Replace Cartridge Or Needle –

To remove cartridge, procedure is as follows:

1. Raise tone arm to a vertical position and remove pickup lead lugs from cartridge terminals.
2. Remove two mounting screws and take cartridge from arm.

To replace needle proceed as follows:

1. To remove the needle, raise the tone arm and, while holding the tone arm with one hand, turn the needle selector toward the 78 r.p.m. position.
2. With the selector held at a slight angle to the normal 78 r.p.m. position, press the selector down toward the inside-rear of the tone arm. Turn the selector to the left until the front of the selector slips out from beneath the holder. Then with a little pressure, move the selector-and-needle assembly to the right and slide it from under the holder.
3. To replace the needle, place the needle selector along side the cartridge, and, with a slight inward pressure on the selector, slide the selector-and-needle assembly under the holder.

Lubrication

All Webcor changers are completely lubricated before leaving the factory. Under normal conditions, this should be sufficient for approximately one year or 1000 hours of operation. However, when operated under extreme conditions of dust or heat the mechanism should be lubricated more often.

Caution: When lubricating the changer, do not permit oil or grease to come in contact with the idler wheel, motor drive shaft, turntable rim, slide plate lever (34), tone arm lockout lever (97), or lift plate friction pad (part of item (61). Any oil or grease on these parts

will prevent proper operation and should be be removed with alcohol.

The following parts should be lubricated with a light mechine oil, using a small oil can or a medicine dropper:

1. Motor bearing (1 drop).
2. Main cam bearing (1 drop).
3. Overarm shaft (1 drop).
4. Turntable bearing race (1 drop).

The following part should be lubricated with a non-fluid high temperature lubricant. Lubricant may be applied with a small brush.

1. Main cam eccentric groove.

Troubles And Probable Remedies

No Sound Output From Changer –

Disconnect leads from cartridge lugs and check output directly at cartridge. If output is normal, trouble is in the wiring and can be located by checking continuity with an ohmmeter. If there is no output from cartridge, check to see that stylus is correctly installed and is riding in record grooves. If this is normal, replace the cartridge.

Sound Is Distorted –

Check stylus pressure with an accurate guage. If pressure is normal (between 8 and 11 grams) replace stylus. If output is still distorted, replace cartridge.

Motor Starts But Turntable Does Not Rotate –

Remove turntable to expose idler wheel assembly (122). Turn reject knob to "78" position and check position of idler wheel. Wheel should be pressing against motor drive shaft. If it does not, check tension of spring (108). If spring is tight, check idler link and stud assembly (125) for binding. If it does bind, remove wheel from its shaft and clean shaft and wheel bushing.

Motor Does Not Start When Reject Knob Is Depressed –

Manually lift tone arm from tone arm rest and swing it towards spindle. If motor does not start, observe switch action as reject knob is depressed. If switch is not pushed out from under stop plate (59), so that plunger is released, check tone arm assembly as described under "Tone Arm Shaft Assembly Adjustment".

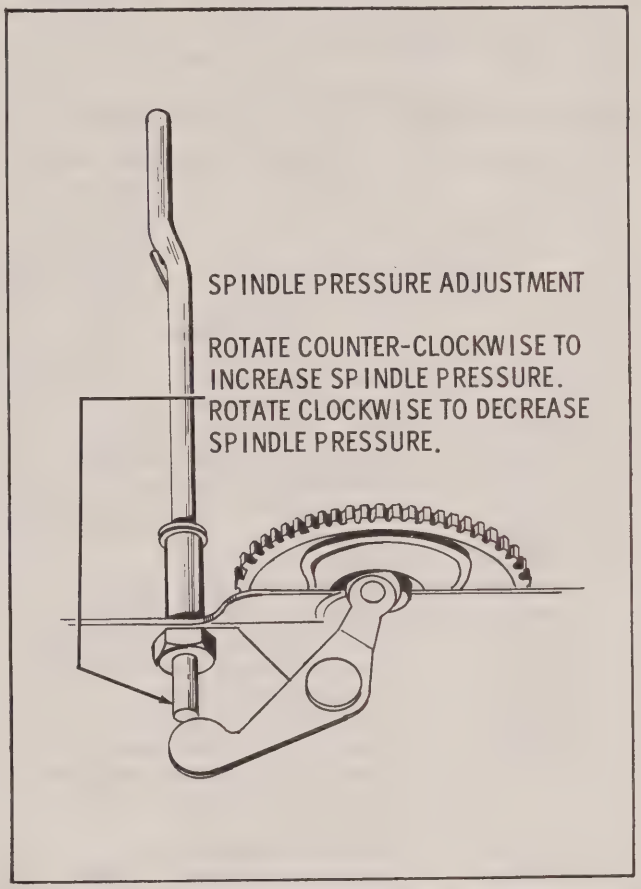
Change Cycle Does Not Start When Reject Knob Is Depressed –

Turn reject knob to "78" position. Check raising lever (62) to see that its guide pin is engaged in the eccentric groove in the bottom of main cam (28). Remove turntable and move slide plate (34) on main cam to make sure that it moves freely.

Depress reject knob and observe action of trip bracket (44) and slide plate (34). The trip bracket should push the slide lever toward spindle and maintain pressure on slide lever so that it can not move back on its own accord. If this condition does not exist, check to see that trip bracket (44) is not binding on the baseplate. Check trip adjustment as described under "Velocity Trip Adjustment."

Record Drops On Tone Arm As Arm Moves Toward Spindle –

Increase spindle pressure by turning spindle adjusting nut (located on bottom of spindle) counter-clockwise.


SPINDLE PRESSURE ADJUSTMENT
ROTATE COUNTER-CLOCKWISE TO INCREASE SPINDLE PRESSURE.
ROTATE CLOCKWISE TO DECREASE SPINDLE PRESSURE.

Record Drops On Tone Arm As Arm Moves Away From Spindle –

Decrease spindle pressure by turning spindle adjusting nut clockwise.

Improper Or Erratic Tone Arm Set Down –

Check semaphore (9) for nicks or warpage. Replace if necessary. Check semaphore adjustment as described under "Semaphore Adjustment".

Slow Or Erratic Speed –

Remove any dirt, oil or grease from the idler wheel, motor drive shaft and turntable rim with alcohol. Check idler wheel for a smooth shiny surface. If this condition exists it can cause slip-page. If necessary, replace idler wheel.

Check idler wheel position against motor drive shaft. If wheel is tilted so that only the edge is pressing against the drive shaft, the idler wheel stud may be bent, and should be straigntened so that entire surface of idler wheel rim contacts the drive shaft.

Place the reject knob in "N" position and turn the turntable by hand to see if the turntable turns easily. If not, clean the turntable bearings and re-lubricate.

Rotate the motor shaft by hand to see if the motor bearings bind. If so, lubricate as described under "Lubrication."

If none of the above conditions exist, replace the motor.

Changer Stalls During Cycle —

Check line voltage. Voltage should be no less than 105 volts. Remove turntable and clean idler wheel and inner turntable rim with alcohol. If ilder wheel has a worn surface, it should be replaced. Rotate main cam (28), by hand, in a clockwise direction. If cam will not rotate completely without undue force being applied, check for binding in the mechanism.

Creaking Or Groaning Noise During Change Cycle —

If lift plate (61) friction pad is rough it will cause excessive friction between the pad and stop plate (61). Rub with wax crayon that portion of stop plate (61) which comes into contact with pad. Smooth operation will result after following this procedure.

With Records On Spindle, Tone Arm Set Down On Rest —

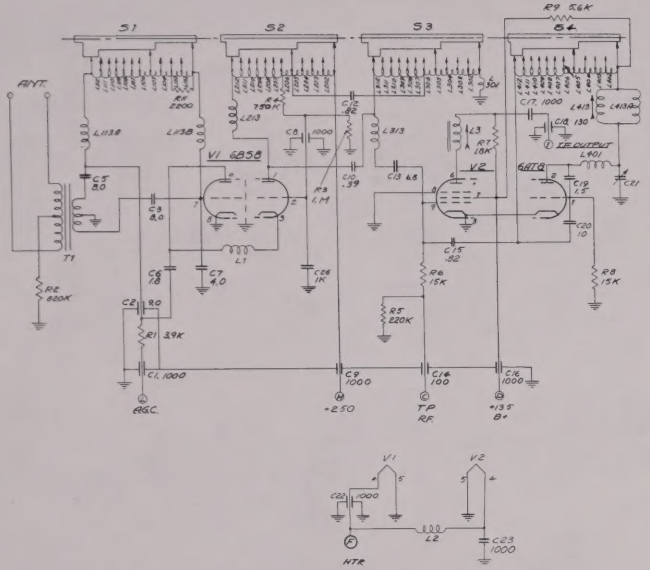
Replace defective or missing lockout tension spring (72). If lockout lever (97) does not pivot about its rivet, clean with alcohol. If changer still does not operate satisfactorily, check the tone arm assembly as described under "Tone Arm Shaft Assembly Adjustment."

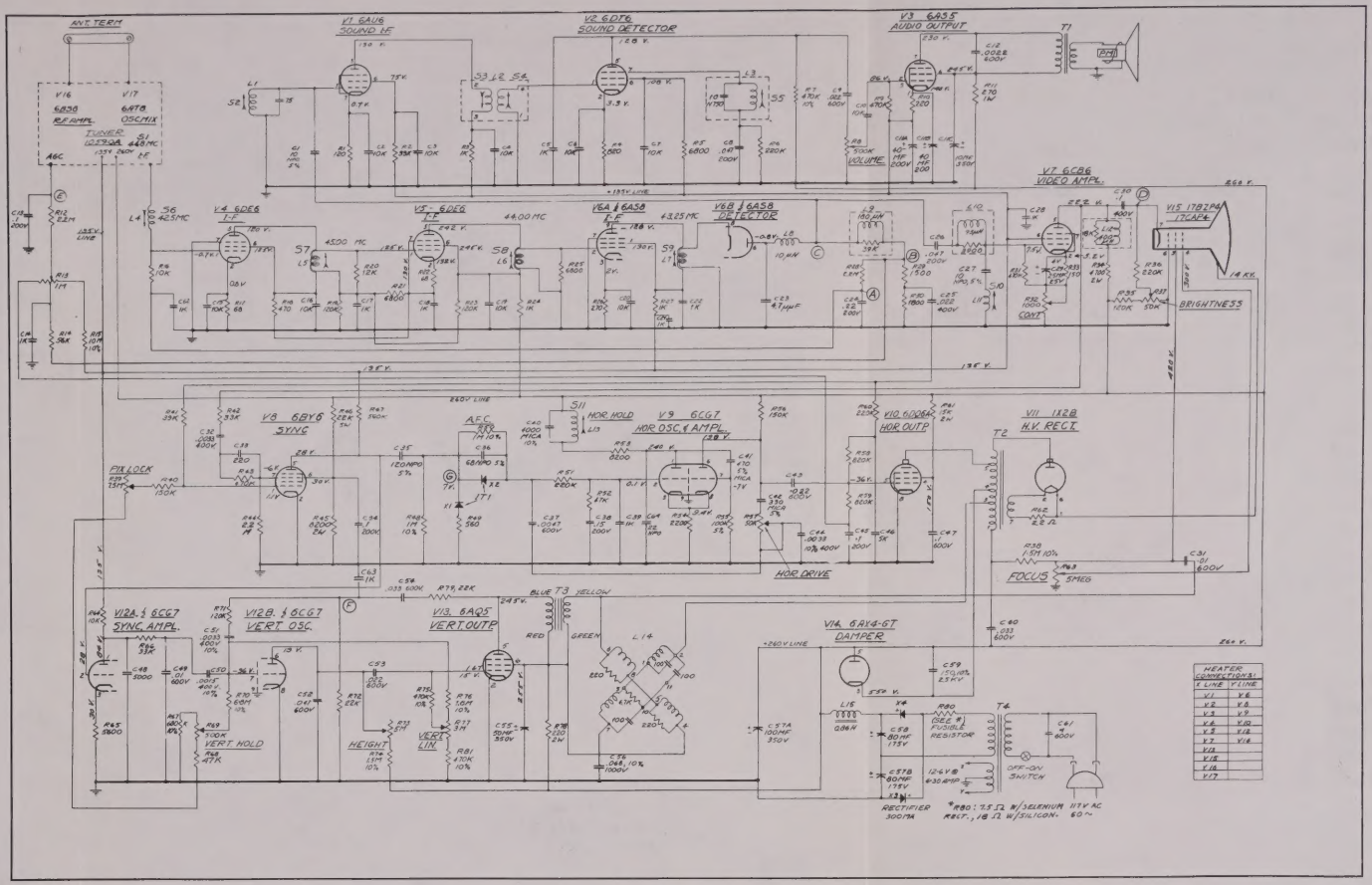
Mechanical Parts List

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	50P348	Turntable Clip	43	49P275-5	Escutcheon — Specify Color
2	11X1564	Turntable-Specify Color	44	45P1876	Trip Bracket
2A	24P124	Turntable Mat-Specify Color	45	11X1294	Reject Bracket
3	25P624	Bearing Race Washer (Top)	46		Part of Reject Bracket (Part of Item 45)
4	11X058	Turntable Bearing Race			
5	25P269	Bearing Race Washer (Bottom)	47		Reject Tension Spring
6	11X1404	Spindle	48	11X1375	Selector Link Assy.
7	11X1389	Overarm	49		Selector Link Grommet (Part of Item 48)
8	26P358	Overarm Pin (Part of Item 7)			
9	49X251	Semaphore-Specify Color	50		Part of Baseplate
10	42P368-1	Overarm Housing-Specify Color	51	11X1651	Tone Arm Bracket Ass'y.
11	46P417	Overarm Compression Spring	52	25P574	"C" Washer
12	25P648	Overarm Shaft Washer	53	45P1902	Reject Rod
13	50P244	Overarm "C" Washer	54	46P417	Torsion Spring-Tone Arm Bracket
14	25P558	Hinge Mounting Grommet (2)			
15	21X362	Tone Arm Hinge and Shaft Ass'y. (Includes Reference Numbers 14 thru 26)	55	45P2086	Friction Spring
			56	45P1862	Tone Arm Weight (2)
			57	45P1887	Record Size Bracket Pawl (Part of Item 94)
16	41P1456	Height Adjusting Screw			
17	25P639	Height Screw Insert, Rubber	58	11X1295	Velocity Trip Arm
18	25P257	Tone Arm Mounting Washer (2)	59	11X1328	Plate and Set Screw
19	26P965	Tone Arm Mounting Screw (2)	60	26P1451	Set Screw - Plate
20	26P1246	Set Down Adj. Screw	61	11X1288	Lift Plate and Pad
21	46P229	Set Down Adj. Compression Spring	62	11X1615	Cam Lever and Pin Ass'y.
			63	25P596	"C" Washer - Lift Plate and Pad
22	21X355	Tone Arm Counterbalance	64	11X1296	Switch Bracket Ass'y.
23	26P1247	Hex Nut, Pivot Screw Adj. Lock	65	32X104	A. C. Switch
24	26P1267	Pivot Screw	66	11X1376	Link
25	26P1253	Tone Arm Shaft Screw	67	26P1450	Link Set Screw
26	21X359	Tone Arm Shaft	68	25P447	"C" Washer - Semaphore Latch
27	49P228	Tone Arm Housing-Specify Color	69	46P403	Compression Spring, Semaphore Latch
28	11X1297	Main Cam			
29		"C" Washer	70	45P1992	Semaphore Latch
30	26P1373	Drive Screw-Main Cam	71	45P2232	Switch Actuating Bracket
31	45P1880	Detent Spring-Main Cam	72	46P439	Tension Spring - Tone Arm Bracket
32	41P1428	Detent Plunger-Main Cam			
33		Slide Plate Ear	73	25P447	"C" Washer - Selector Bracket Mounting
34	11X1291	Slide Plate & Lever, Main Cam			
35		Motor Mounting Screw	74		Lockwashers (2 Used)
36		Washer	75	26P1031	Screw, Overarm Housing Mtg. (2)
37		Baseplate			
38	42P300-9	Tone Arm-Specify Color (Turn Over Cartridge)	76	46P456	Compression Spring - Pin Bracket
38A	42P300-2	Tone Arm - G. E. Cartridge Type — Specify Color	77	50P342	"E" Washer - Pin Bracket
			78	25P288	Washer - Pin Bracket
38B	42P365	Tone Arm-Ceramic Cartridge Type - Specify Color	79	45P2193	Spring Guide Lug (Part of Item 62)
39	45P1429	Lift Stop Bracket	80	45P2194	Pin Bracket (Part of Item 62)
40	49P270	Tone Arm Rest - Specify Color	81	41P1577	Retracting Pin - Pin Bracket
41	49P226-7	Selector Reject Knob — Specify Color	82	46P457	Tension Spring - Selector Bracket
42	41P404	Reject Knob Shaft	83	45P2198	Shift Arm

Mechanical Parts List (Con't)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
84	45P2196	Connector Link (Part of Item 83)	110	48P075	Connecting Link
85	41P557	Collar	111	17X717	Cam And Pin Assembly
86	26P676	Collar Set Screw	112	41P1568	Pin - Yoke Lever
87	45P2195	Selector Bracket	113	25P574	"C" Washer - Cam And Pin Ass'y.
88	45P2192	Shift Link	114		Motor Mounting Plate
89	45P2199	Shift Link Extension	115	25P352	Lockwasher - Spindle Mounting
90	26P403	Screw - Shift Link	116		Speed Detent Arm
91		Lockwasher	117		Lockwasher
92		"E" Washer	118	25P596	"C" Washer - Yoke
93		Washer	119	46P465	Compression Spring - Yoke
94	45P2200	Record Size Bracket Ass'y.	120	25P447	"C" Washer - Idler Wheel
95	25P596	"C" Clip - Switch Actuating Bracket	121	25P394	Washers - Idler Wheel (3)
96	45P1872	Lockout Pawl	122	11X1607	Idler Wheel Assembly
97	45P1875	Lockout Lever	123	45P1871	Pivot Bracket
98	50P244	"C" Clip - Shift Arm Mtg.	124	46P460	Tension Spring - Idler Wheel
99	11X1622	Stiffener Ass'y. (Includes 100 And 101)	125	17X707	Idler Link And Stud Assembly
100	27P102	Rivet-Spindle Lever	126	25P535	"C" Washer - Motor Mtg. (3)
101	11X1285	Spindle Lever And Roller	127	25P394	Washer - Motor Mtg. (3)
102	26P1381	Nut, Spindle Mounting	128	25P635	Grommet - Motor Mtg. (3)
103	50P342	"C" Clip - Speed Change Rod (2)	129		Driver Pulley With Set Screw
104	45P2207-1	Speed Change Rod	130		Set Screw
105	45P2188	Yoke Lever	131	15X229-1	Motor, Complete With Studs And Mounting Plate
106	25P596	"C" Washer - Connecting Link	132	45P2215	Cam Lever Spring Bracket
107	17X706	Yoke And Pin Ass'y.	133	46P397	Tension Spring - Pivot Bracket
108	46P458	Tension Spring - Yoke Lever	134	26P1420	Screws - A.C. Switch Mounting (2)
109	45P2189	Push Lever			





PACKARD-BELL
MODEL CHASSIS
17VT4 V8-2

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RCA MODELS	CHASSIS
21RT8202	KCS113H
21RT8425	KCS113K
21T8202, U	KCS113A, B
21T8205, U	"
21T8207, U	"
21T8265, U	"
21T8267, U	"
21T8375, U	KCS113P, R
21T8376, U	"
21T8377, U	"
21T8395, U	"
21T8397, U	"
21T8405, U	"
21T8407, U	"
21T8425, U	KCS113E, F
21T8426, U	"
21T8427, U	"
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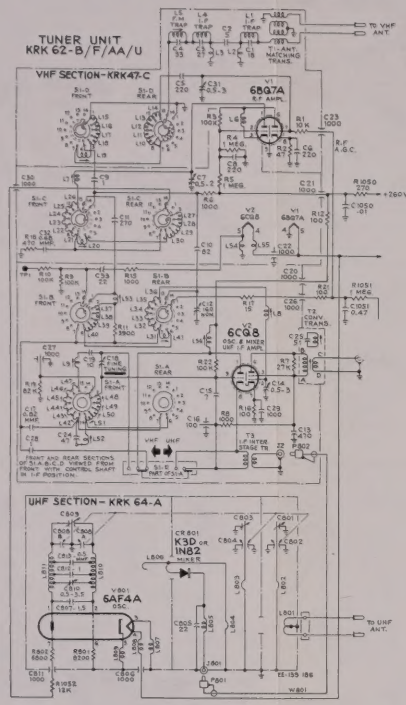

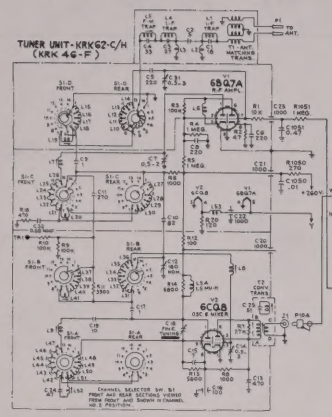

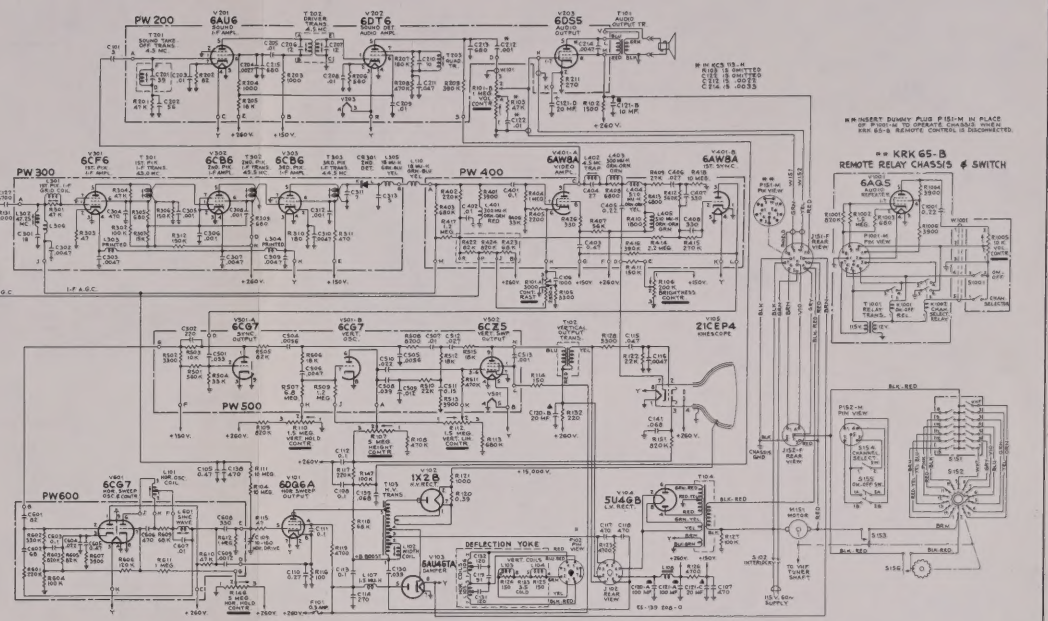

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